Supplemental Filing

Supplement III in Response to Data Requests

1 through 104 and April 25 Workshop Queries

In support of the

Application for Certification

for the

Walnut Creek Energy Park

City of Industry, California

(05-AFC-02)

Submitted to the:

California Energy Commission

Submitted by:

Walnut Creek Energy, LLC

A wholly owned subsidiary of

EDISON MISSION ENERGY®

An EDISON INTERNATIONAL® Company

With Technical Assistance by:

CH2MHILL

Sacramento, California

August 2006

Contents

Introduction

The following are Walnut Creek Energy, LLC's (WCE's), third supplemental responses to Data Requests for the Walnut Creek Energy Park (05-AFC-02). The CEC Staff served these data requests as part of the discovery process for the WCEP project. WCE has provided written Data Request Responses to all of the data requests issued on March 10, 2006. In some cases, however, full responses were deferred for additional time. In addition, Staff asked for additional information during the Data Request Response Workshop held on April 25, 2006, relating to some data requests or topic areas, and Staff has issued a second round of data requests, dated June 21, 2006. This document provides additional information in response to the informal requests made at the workshop and the second round of Data Requests. If information is provided in response to a specific Data Request, the response is keyed to a Data Request number. If the information is provided in response to a workshop query, the response is numbered sequentially with a "WSQ" prefix.

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as CEC Staff presented them and are keyed to the Data Request numbers. New or revised graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request #15 would be numbered Table DR15-1. The first figure used in response to Data Request #28 would be Figure DR28-1, and so on. Other supporting information in response to a data request (supporting data, stand-alone documents such as plans) is found at the end of a discipline-specific section as numbered attachments. These additional pieces of information are not sequentially page-numbered consistently with the remainder of the document, but may have their own internal page numbering system.

Air Quality

Air Quality

Fine Particulate Matter ($PM_{2.5}$) Mitigation

DR6. Please provide proposal(s) to mitigate the facility's potentially significant $PM_{2.5}$ impacts.

Response: VSE expects to offset $PM_{2.5}$ impacts through the South Coast Air Quality Management District (SCAQMD) Priority Reserve bank. Analysis of the credits available in this bank demonstrates that credits for PM_{10} will adequately offset $PM_{2.5}$ impacts. This analysis is described in Attachment AIR-6.

Cumulative Impacts Analysis

DR29. Please clarify whether an air quality cumulative impact analysis has been performed. If it has, please provide the modeling assumptions, model input and output files, and modeling results.

DR30. If a cumulative impact analysis has not been performed, please discuss the status of efforts to obtain a list of projects near the WCEP project site that meet the criteria listed in Section 8.1H, Cumulative Impacts Analysis Protocol. If the aforementioned list has been obtained, please submit the list of the emission sources to be included in the cumulative air quality impacts analysis. Upon staff's review of and concurrence with the sources identified, please perform a cumulative impact analysis according to the modeling protocol in the AFC.

Response: Under the CEC's power plant site certification regulations (Title 20, California Code of Regulations, Chapter 5, Appendix B), Applicants are required to submit with the application a protocol for conducting a modeling analysis of the project's potential air quality impacts in combination with other stationary sources "within a six-mile radius that have received construction permits but are not yet operational, or are in the permitting process (Title 20, Appendix B[g]8][iii])." A protocol for this analysis was submitted as Appendix 8.1H to the Application for Certification. This protocol outlined the methods that would be used for an air dispersion analysis to assess the potential project cumulative impacts on a localized basis. This protocol recognized the CEC Staff's request that potential cumulative impacts be considered for projects within an 6-mile radius of the project site. The purpose of the analysis was to assess whether emissions concentrations from the project would contribute to a violation of ambient air quality standards.

Localized impacts from WCEP could result from emissions of carbon monoxide (CO), oxides of nitrogen (NOx), sulfur oxides (SOx), and directly emitted particulate matter less than 10 microns in diameter (PM_{10}). A dispersion modeling analysis of potential cumulative air quality impacts was performed for CO, NOx, and PM10. No cumulative multisource modeling analyses were performed for SOx since there were no sources of SOx other than WCEP meeting the applicability criteria described below. Potential cumulative impacts for SO_2 are evaluated in the AFC (Air Quality) based on maximum modeled WCEP impacts plus maximum background concentrations.

Projects that exist and have been in operation prior to 1-1-2005 will be reflected in the ambient air quality data that has been used to represent background concentrations; consequently, no further analysis of the emissions from this category of facilities will be performed. The cumulative impacts analysis adds the modeled impacts of selected facilities to the maximum measured background air quality levels, thus ensuring that these existing projects are taken into account.

Based on the results of the air quality modeling analyses described in the AFC (Air Quality), "significant" air quality impacts, as that term is defined in federal air quality modeling guidelines, have not been shown for the WCEP project. Typically, if the project's impacts do not exceed the significance levels, no cumulative impacts would be expected to occur, and no further analysis would be required. Notwithstanding the above, a cumulative impacts analysis was prepared for all projects identified within a search area with a radius of 8 miles beyond the project's impact area. Table DR30-1 lists the facilities within this search area that were included in the analysis:

TABLE DR30-1
Facilities Included In The Cumulative Air Impacts Analysis

Facility	Source Type	Id No.
Nationwide Boiler Inc.	20-50 Mmbtu/Hr LPG Boilers	79621
Zamora Mexican Foods	N/A	135492
USA Foods, Inc.	5-20 Mmbtu/Hr NG Boiler	136655
CEPS, LLC	Cogeneration Facility	138267
Schlumberger Well Services	Portable Engines > 500 hp	138493
COI Energy Center, LLC.	Stationary Engine > 500 hp	143396
Eagle Crusher Co. Inc.	Portable Engines > 500 hp	147705

This list of sources having non-zero emissions within the project region, and that met certain criteria for inclusion in the cumulative air impacts analysis as identified by CEC staff, was obtained from the SCAQMD.

Given the potentially wide geographic area over which the dispersion modeling analysis may be performed, the ISCST3 model was used to evaluate cumulative localized air quality impacts. The detailed modeling procedures, ISCST3 options, and meteorological data used in the cumulative impacts dispersion analysis were the same as those described in the AFC Air Quality section.

Dispersion Modeling Methods

The dispersion modeling analysis of cumulative localized air quality impacts for the proposed project was evaluated in combination with other reasonably foreseeable projects and air quality levels attributable to existing emission sources, and the impacts were compared to state or federal air quality standards to determine significance. The maximum modeled concentrations were used to demonstrate compliance with California ambient air quality standards (CAAQS) and Federal (USEPA) National ambient air quality standards (NAAQS).

Supporting information used in the analysis included the following:

- Each source's respective coordinate locations
- Stack parameters for sources included in the cumulative air quality impacts dispersion modeling analysis
- Output files for the dispersion modeling analysis

The SCAQMD did not provide stack parameters for the sources in the cumulative inventory and has no method to track these parameters. Thus, based on guidance from EPA, the worst-case emissions for each facility were modeled out of a single stack that was 0.1 meters in height with a stack diameter of 0.1 meters, ambient exhaust temperature, and an exit velocity of 0.01 meters/second. Facility locations were provided by SCAQMD or were obtained from the facility address using mapping software (Microsoft Streets & Trips) and converted from latitude/longitude to UTM coordinates using the US Army Corps of Engineers program CORPSCON. Three facilities (79621, 138493, and 147704) are identified as temporary sources that can be located at "various locations in the SCAQMD" (such as remediation equipment). These three facilities were conservative modeled at the locations of the SCAQMD main offices in Diamond Bar since this is the "location" at which they are entered into the database. Stack elevations were set equal to the WCEP stack base elevation. Emissions provided by the SCAQMD and modeled facility locations are shown in Table DR30-2.

TABLE DR30-2
Modeled Stack Locations and Emissions (lbs/day)

Facility ID	UTM-X (km)	UTM-Y (km)	NOx (lb/day)	CO (lb/day)	PM10 (lb/day)
79621	423.340	3762.323	16	52	10
135492	411.171	3764.817	1	0	0
136655	409.334	3765.832	2	8	1
138267	415.312	3763.226	11	26	1
138493	423.340	3762.323	32	14	1
143396	416.509	3762.772	15	35	1
147705	423.340	3762.323	70	41	7

The proposed project was modeled with these sources in the cumulative multisource analysis to determine maximum concentrations. The maximum background concentrations were then added to this total and compared to CAAQS and NAAQS.

Dispersion Modeling Results

Table DR30-3 below summarizes the results of the cumulative modeling analysis. As the table shows, maximum modeled concentrations are less than the CAAQS and NAAQS for all pollutants and averaging times. Maximum ambient (modeled plus background) concentrations are greater than the CAAQS for 1-hour NO_2 and greater than the CAAQS/NAAQS for 24-hour and annual PM_{10}. Maximum ambient (modeled plus background) concentrations exceed the PM_{10} standards because the background concentrations already exceed the applicable standards (e.g., there were no modeled PM_{10} concentrations without background greater than the CAAQS or NAAQS). Maximum ambient (modeled plus background) concentrations for all other pollutants and averaging times (NO_2 for annual averaging times and CO for all averaging times) are less than the CAAQS and NAAQS.

TABLE DR30-3
Cumulative Impacts Modeling Results (μg/m³)

Pollutant	Averaging Time	Maximum Multisource Concentration (μg/m³)	Background (μg/m³)	Total Ambient Concentration (μg/m³)	State Standard (μg/m³)	Federal Standard (μg/m³)
NO_2	1-hour	253.9	297	550.9	470	-
	Annual	6.6	67.9	74.5	-	100
CO	1-hour	592.4	12,571	13,163.4	23,000	40,000
	8-hour	222.2	4,989	5,211.2	10,000	10,000
PM_{10}	24-hour	6.8	164.0	170.5	50	150
	Ann.Geo.	0.6	58.1	58.7	30	-
	Ann.Arith.	0.6	58.1	58.7	-	50

Only one receptor had maximum ambient (modeled plus background) 1-hour NO_X concentration greater than the CAAQS. These impacts were due to emissions from the COI Energy Center stationary engine and occurred at a receptor less than 50 meters from the modeled source location. The maximum 1-hour NO_X impact for WCEP emissions at this location (for any time during the meteorological data modeled) was 17.3 μg/m³, which is less than the 1-hour NO_2 significant impact level of 19 μg/m³. The significance level is defined as the concentration at which a source contributes to background air quality. Therefore, WCEP does not cause or contribute to this exceedance.

Conclusion

With the exception of 24-hour and annual PM_{10}, where the background data already exceeds the state and federal standards, the modeled cumulative 1-hour NO_2 concentration could exceed the 1-hour NO_2 standard when the background is added to this modeled concentration. However, the WCEP contribution to this modeled exceedance is less than the 1-hour NO_2 significance level for this pollutant. Thus, the proposed project is not expected to contribute to this exceedance and will comply with all air quality standards.

Attachment AIR-6

Analysis of PM_{10} Offsets in the Priority Reserve

Fraction of Directly Emitted $PM_{2.5}$ in South Coast Air Basin PM_{10} Priority Reserve Credits

PREPARED FOR: Edison Mission Energy

PREPARED BY: Bill Dennison, CH2M HILL

DATE: August 30, 2006

As part of the Application for Certification (AFC) approval process for the Edison Mission Energy Walnut Creek Energy Park and Sun Valley Energy Project, California Energy Commission (CEC) staff has requested information regarding the amount of PM2.5 in Priority Reserve PM_{10} Credits that are proposed to be used as emission offset mitigations.

Priority Reserve Credits are unique to the South Coast Air Basin. This pool of emission reduction credits was established with the June 1990 amendments to the SCAQMD Regulation XIII, its New Source Review regulation. This pool of credits and a defined rate for future funding of the credit pool was developed to ensure that sufficient offsets would be available for innovative technology projects, research operations and essential public service projects, such as schools, hospitals, sewage treatments plants, landfills, etc. Emission reduction credits were to be made available to eligible projects at no cost. The SCAQMD has funded the Priority Reserve pool with stationary source emission reductions from its New Source Account, including "orphan shutdown credits."

Temporary access to the Priority Reserve pool of emission credits was provided to Electric Generating Facilities (EGF) under certain conditions for projects with applications submitted between 2001 and 2003. Recognizing that there is a significant need to increase energy production to avoid the type of energy crisis that California experienced in 2000-2001, the SCAQMD has proposed to again provide access to emissions reduction credit access for EGFs through its Priority Reserve pool of credits. The mechanism to effect this access will be proposed modifications to District Rule 1309.1.

While there are now ambient air quality standards for $PM_{2.5}$, State Implementation Plans (SIP), including the District's Air Quality Management Plan (AQMP), are in the developmental stages and are not required to be completed before 2007. Changes to the New Source Review (NSR) rules and programs to specifically identify $PM_{2.5}$ will occur later. Thus, both the traditional Emission Reduction Credits (ERCs) and Priority Reserve pool of credits list particulate emissions as PM_{10}. Conversion to $PM_{2.5}$ or issuance of $PM_{2.5}$ emissions credits would not be expected until after the changes to the NSR program and rules are effected.

Presently, there is no official listing of $PM_{2.5}$ ERCs or accounting of the $PM_{2.5}$ portion of ERCs or Priority Reserve credits, as there has been no requirement for agencies such as the SCAQMD to track this information. However, since both ERCs and Priority Reserve credits are derived from stationary source emission reductions, the fraction of $PM_{2.5}$ in PM_{10} credits should be reflective of existing stationary source emissions. Both the SCAQMD and CARB have published South Coast Air Basin emission inventories that have identified both PM_{10} and the subset $PM_{2.5}$ emissions for stationary, area and mobile sources. The SCAQMD's 2007 AQMP, which will contain the SCAQMD's latest emission inventory, is currently in preparation.

The most current published emission inventory information is contained in the California Almanac of Emissions and Air Quality, 2006 Edition. Using source-specific PM speciation profiles, CARB has developed PM_{10}/$PM_{2.5}$ emission inventories that cover the period from 1975 through 2020. Speciation data from the Almanac for the period from 1990 through 2005 have been excerpted from the Almanac, as these data should more accurately reflect emission reductions that the District accumulated for the Priority Reserve pool of credits. A summary of these speciated data is presented in the following table and the attached chart. The more detailed data and specific PM_{10} and $PM_{2.5}$ emissions pages from the Almanac are also attached to this report. As shown in Table 1 and the attached graph, directly emitted $PM_{2.5}$ emissions, over the period from 1990 to 2005, constituted 79.7 to 85.7 percent of stationary source PM_{10} emissions. Thus, it is reasonable to assume that the $PM_{2.5}$ fraction of PM_{10} ERCs or Priority Reserve credits that would be used to offset emissions from proposed EGFs would be approximately 80 percent.

TABLE 1
South Coast Air Basin – Directly Emitted PM10/PM2.5 Stationary Source Emissions (tons/day, annual average)

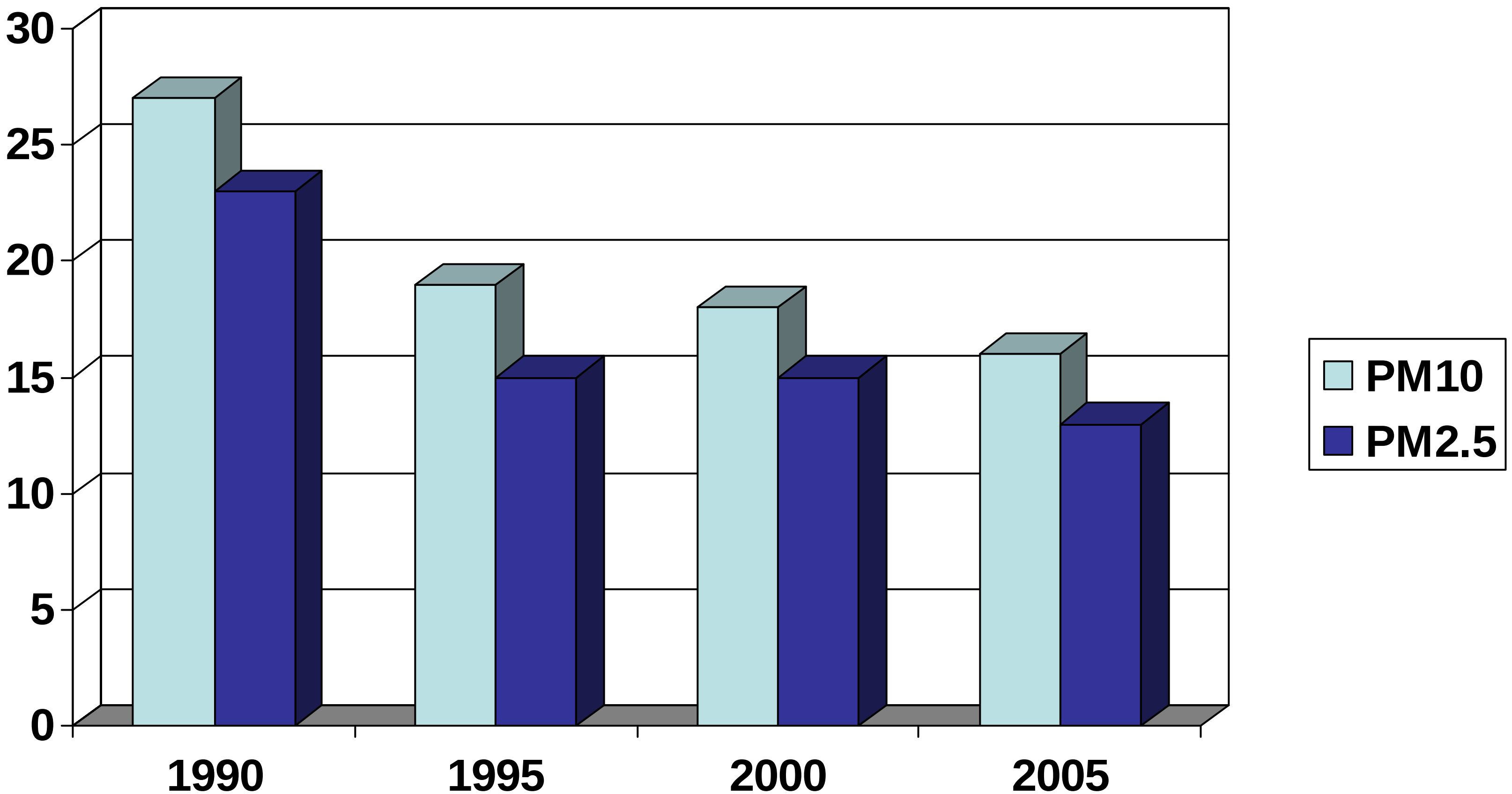
	1990		1995		2000		2005	
Summary Category Name	**PM10**	**PM2.5**	**PM10**	**PM2.5**	**PM10**	**PM2.5**	**PM10**	**PM2.5**
Fuel Combustion	12.163	12.003	7.940	7.833	7.710	7.599	6.320	6.253
Waste Disposal	0.433	0.403	0.281	0.263	0.370	0.311	0.444	0.420
Cleaning and Surface Coating	0.728	0.701	0.048	0.046	0.135	0.130	0.535	0.407
Petroleum Production and Marketing	2.578	2.354	2.048	1.871	1.279	0.951	1.109	0.895
Industrial Processes	11.173	7.736	8.380	5.122	8.259	5.560	7.318	4.552
Total Stationary Sources	27.075	23.198	18.698	15.136	17.753	14.550	15.726	12.527
PM2.5 Percent		**85.7**		**80.9**		**82.0**		**79.7**

Source: California Air Resources Board, The California Almanac of Emissions and Air Quality – 2006 Edition

South Coast Air Basin

Stationary Source PM_{10}/$PM_{2.5}$ Emissions

(tons/day, annual avg day)



Source: The California Almanac of Emissions and Air Quality – 2006 Edition

South Coast Air Basin
Directly Emitted $PM_{2.5}$ Emission Trends and Forecasts

Direct emissions of $PM_{2.5}$ have decreased slightly in the South Coast Air Basin since 1975. Stationary source emissions have been decreasing, while area-wide emissions have been increasing. A more significant decrease in emissions would have been observed, if not for growth in emissions from area-wide sources, primarily fugitive dust from paved and unpaved roads and other sources. The increase in activity of these area-wide sources reflects the increased growth and VMT in the air basin.

Particulate matter can be directly emitted into the air (primary PM) or, similar to ozone, it can be formed in the atmosphere (secondary PM) from the reaction of gaseous precursors such as NO_x, SO_x, ROG, and ammonia. The $PM_{2.5}$ emission inventory includes only directly emitted particulate emissions. On an annual average basis, directly emitted $PM_{2.5}$ emissions contribute approximately 40 percent of the ambient $PM_{2.5}$ in the South Coast Air Basin.

Directly Emitted $PM_{2.5}$ Emission Trends (tons/day, annual average)

Emission Source	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020
All Sources	*119*	*110*	*108*	*125*	*108*	*107*	*97*	*97*	*98*	*100*
Stationary Sources	52	34	22	23	15	15	13	13	13	14
Area-wide Sources	35	41	46	63	62	61	53	54	55	57
On-Road Mobile	11	13	19	17	14	13	13	13	13	13
Gasoline Vehicles	6	5	5	6	6	7	8	9	10	10
Diesel Vehicles	5	9	14	11	8	6	5	4	3	3
Other Mobile	22	22	21	22	17	18	18	18	17	16
Gasoline Fuel	2	2	2	3	3	3	4	4	4	5
Diesel Fuel	19	19	17	18	13	12	11	10	8	7
Other Fuel	1	1	1	1	2	2	3	4	4	5

Table 4-7

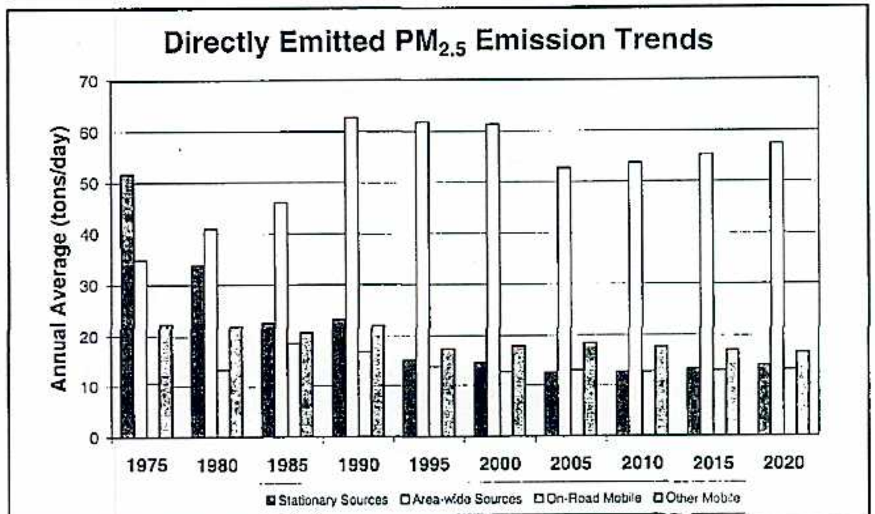


Figure 4-7

South Coast Air Basin

Directly Emitted PM_{10} Emission Trends and Forecasts

Direct emissions of PM_{10} have been increasing in the South Coast Air Basin since 1975. A decrease in emissions would have been observed, if not for growth in emissions from area-wide sources, primarily fugitive dust from paved and unpaved roads and other sources. The increase in activity of these area-wide sources reflects the increased growth and VMT in the air basin.

Particulate matter can be directly emitted into the air (primary PM) or, similar to ozone, it can be formed in the atmosphere from the reaction of gaseous precursors such as NO_x, SO_x, ROG, and ammonia (secondary PM). The PM_{10} emission inventory includes only directly emitted particulate emissions. On an annual average basis, directly emitted PM_{10} emissions contribute approximately 65 percent of the ambient PM_{10} in the South Coast Air Basin.

Directly Emitted PM_{10} Emission Trends (tons/day, annual average)

Emission Source	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020
All Sources	228	239	261	347	330	325	276	278	284	292
Stationary Sources	56	40	28	27	19	18	16	16	17	17
Area-wide Sources	133	157	186	273	273	269	221	223	229	236
On-Road Mobile	15	17	24	22	19	19	19	19	20	20
Gasoline Vehicles	10	8	9	10	11	12	13	15	16	17
Diesel Vehicles	5	9	15	12	8	6	6	4	3	3
Other Mobile	25	24	23	24	19	20	21	20	19	19
Gasoline Fuel	3	3	3	4	4	4	5	5	6	6
Diesel Fuel	21	20	19	19	14	13	12	11	9	7
Other Fuel	1	1	1	1	2	2	3	4	5	5

Table 4-6

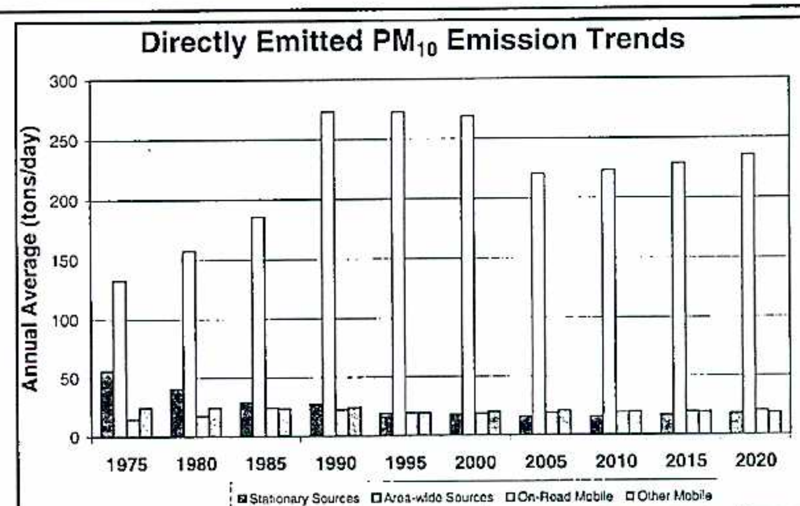


Figure 4-6

2006 Almanac Data

Particulate Matter < 10 Microns Projected Emission Inventory

SOUTH COAST AIR BASIN

REPORT TYPE: GROWN AND CONTROLLED
SEASON: ANNUAL AVERAGE
BASE YEAR: 2005

All emissions are represented in Tons per Day and reflect the most current data provided to ARB
Download this data as a comma delimited file.
Download more detail data as a comma delimited file.

STATIONARY SOURCES				
SUMMARY CATEGORY NAME	1990	1995	2000	2005
FUEL COMBUSTION				
ELECTRIC UTILITIES	1.300	0.810	0.759	1.398
COGENERATION	0.896	0.053	0.665	0.073
OIL AND GAS PRODUCTION (COMBUSTION)	0.044	0.041	0.203	0.159
PETROLEUM REFINING (COMBUSTION)	3.918	3.536	2.315	1.689
MANUFACTURING AND INDUSTRIAL	1.904	1.214	1.443	1.114
FOOD AND AGRICULTURAL PROCESSING	0.928	0.209	0.197	0.160
SERVICE AND COMMERCIAL	2.235	1.680	1.596	1.446
OTHER (FUEL COMBUSTION)	0.938	0.398	0.531	0.281

* TOTAL FUEL COMBUSTION	12.163	7.940	7.710	6.320
WASTE DISPOSAL				
SEWAGE TREATMENT	0.004	0.000	0.000	0.003
LANDFILLS	0.213	0.174	0.168	0.313
INCINERATORS	0.104	0.036	0.082	0.103
OTHER (WASTE DISPOSAL)	0.111	0.072	0.121	0.025
* TOTAL WASTE DISPOSAL	0.433	0.281	0.370	0.444
CLEANING AND SURFACE COATINGS				
LAUNDERING	0.001	0.000	0.000	0.000
DEGREASING	0.032	0.000	0.000	0.000
COATINGS AND RELATED PROCESS SOLVENTS	0.603	0.048	0.133	0.446
PRINTING	0.025	0.000	0.000	0.000
ADHESIVES AND SEALANTS	0.000	0.000	0.000	0.000
OTHER (CLEANING AND SURFACE COATINGS)	0.067	0.000	0.001	0.088
* TOTAL CLEANING AND SURFACE COATINGS	0.728	0.048	0.135	0.535
PETROLEUM PRODUCTION AND MARKETING				
OIL AND GAS PRODUCTION	0.006	0.001	0.024	0.004
PETROLEUM REFINING	2.547	2.028	1.226	1.079
PETROLEUM MARKETING	0.021	0.020	0.029	0.026
OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.004	0.000	0.000	0.000
* TOTAL PETROLEUM PRODUCTION AND MARKETING	2.578	2.048	1.279	1.109
INDUSTRIAL PROCESSES				
CHEMICAL	0.949	0.302	0.521	0.537
FOOD AND AGRICULTURE	0.234	0.091	0.197	0.174
MINERAL PROCESSES	4.497	1.903	2.936	2.042
METAL PROCESSES	1.706	0.378	0.832	0.483
WOOD AND PAPER	2.584	3.044	3.390	3.558
GLASS AND RELATED PRODUCTS	0.497	0.135	0.227	0.265
ELECTRONICS	0.012	0.001	0.002	0.006
OTHER (INDUSTRIAL PROCESSES)	0.694	2.527	0.153	0.253
* TOTAL INDUSTRIAL PROCESSES	11.173	8.380	8.259	7.318

** TOTAL STATIONARY SOURCES	27.075	18.698	17.753	15.726
GRAND TOTAL FOR SOUTH COAST	27.075	18.698	17.753	15.726

* Emissions from natural sources are excluded.

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Welcome to California

Air Resources Board

2006 Almanac Data

Particulate Matter < 2.5 Microns Projected Emission Inventory

SOUTH COAST AIR BASIN

REPORT TYPE: GROWN AND CONTROLLED
SEASON: ANNUAL AVERAGE
BASE YEAR: 2005

All emissions are represented in Tons per Day and reflect the most current data provided to ARB
Download this data as a comma delimited file.
Download more detail data as a comma delimited file.

STATIONARY SOURCES				
SUMMARY CATEGORY NAME	1990	1995	2000	2005
FUEL COMBUSTION				
ELECTRIC UTILITIES	1.289	0.808	0.758	1.395
COGENERATION	0.872	0.050	0.661	0.069
OIL AND GAS PRODUCTION (COMBUSTION)	0.044	0.041	0.201	0.157
PETROLEUM REFINING (COMBUSTION)	3.862	3.464	2.268	1.660
MANUFACTURING AND INDUSTRIAL	1.892	1.206	1.430	1.107
FOOD AND AGRICULTURAL PROCESSING	0.909	0.206	0.194	0.158
SERVICE AND COMMERCIAL	2.227	1.678	1.592	1.444
OTHER (FUEL COMBUSTION)	0.908	0.381	0.496	0.262

*** TOTAL FUEL COMBUSTION**	12.003	7.833	7.599	6.253
WASTE DISPOSAL				
SEWAGE TREATMENT	0.003	0.000	0.000	0.003
LANDFILLS	0.213	0.174	0.168	0.301
INCINERATORS	0.085	0.025	0.070	0.092
OTHER (WASTE DISPOSAL)	0.103	0.064	0.073	0.025
*** TOTAL WASTE DISPOSAL**	0.403	0.263	0.311	0.420
CLEANING AND SURFACE COATINGS				
LAUNDERING	0.001	0.000	0.000	0.000
DEGREASING	0.031	0.000	0.000	0.000
COATINGS AND RELATED PROCESS SOLVENTS	0.580	0.046	0.128	0.321
PRINTING	0.024	0.000	0.000	0.000
ADHESIVES AND SEALANTS	0.000	0.000	0.000	0.000
OTHER (CLEANING AND SURFACE COATINGS)	0.065	0.000	0.001	0.085
*** TOTAL CLEANING AND SURFACE COATINGS**	0.701	0.046	0.130	0.407
PETROLEUM PRODUCTION AND MARKETING				
OIL AND GAS PRODUCTION	0.005	0.001	0.021	0.004
PETROLEUM REFINING	2.325	1.852	0.902	0.867
PETROLEUM MARKETING	0.021	0.019	0.028	0.025
OTHER (PETROLEUM PRODUCTION AND MARKETING)	0.004	0.000	0.000	0.000
*** TOTAL PETROLEUM PRODUCTION AND MARKETING**	2.354	1.871	0.951	0.895
INDUSTRIAL PROCESSES				
CHEMICAL	0.906	0.288	0.504	0.497
FOOD AND AGRICULTURE	0.037	0.017	0.061	0.028
MINERAL PROCESSES	2.941	1.056	2.000	1.108
METAL PROCESSES	1.388	0.311	0.622	0.341
WOOD AND PAPER	1.563	1.833	2.042	2.158
GLASS AND RELATED PRODUCTS	0.385	0.110	0.223	0.250
ELECTRONICS	0.009	0.000	0.002	0.003
OTHER (INDUSTRIAL PROCESSES)	0.507	1.506	0.106	0.166
*** TOTAL INDUSTRIAL PROCESSES**	7.736	5.122	5.560	4.552

** TOTAL STATIONARY SOURCES	23.198	15.136	14.550	12.527
GRAND TOTAL FOR SOUTH COAST	23.198	15.136	14.550	12.527

* Emissions from natural sources are excluded.

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Land Use

Land Use

Laydown Area Lease Option Agreement

WSQ-10 Please provide the following information:

1. *Provide a project description for the development of the container storage site?*
2. *What is the surfacing (asphalt?) that will be applied to the container storage site?*
3. *What will be the size of the container storage site?*
4. *What is the schedule for LTI's construction of the container storage site? (when does LTI expect to begin/end construction?)*
5. *How will responsibility be assigned for cleanup of waste during (and immediately after) the period that it will be used for construction lay down by WCE?*
6. *How much traffic is anticipated from the container storage site during operation of the WCEP?*

Response: Responses keyed by number, as follows:

1. LTI's container storage project involves paving approximately 20 acres of land owned by, and leased from, Southern California Edison Company lying beneath transmission lines in the City of Industry. Walls, fencing, landscaping, and guarded entries will be installed for security and appearance.
2. Asphalt paving.
3. Twenty acres or more.
4. Construction will only take a few months, and will begin after receiving CPUC approval. LTI expects to have the facility operational by mid-2007.
5. WCE's lease agreement with LTI states: "upon expiration of the term of the Sublease Lessee shall be obligated to return the Property substantially to its original condition, including repairing any damage caused by the installation of such fencing to the asphalt on the Property."
6. WCE has no reliable method for determining the volume of container storage traffic that will take place during operation of the WCEP.

Visible Plume Modeling

Visible Plume Modeling

Visible Plume Modeling Results

DR77. If the applicant performed a visible plume modeling analysis in support of the AFC Visual Resources conclusion, please provide:

a. the modeling results;
b. any meteorological data used in the analysis;
c. a full discussion of all assumptions;
d. the name and version of the model used; and
e. all model input and output files.

Response: The visual plume modeling analysis is included as Attachment VP-1.

Cooling Tower Data

DR102. Please confirm the cooling tower data provided in the supplemental data response, or provide corrections to this data as necessary.

DR103. Please explain the low air flow for this cooling tower and describe the technical differences between the cooling for this project and the cooling for combined-cycle projects that allow for the WCEP's higher cooling water temperatures and very low cooling tower air flows.

DR104. Please discuss whether the cooling tower would be redesigned to allow for higher air flow rates (around 15 kg/s/MW), or whether there are other design changes that would effectively reduce the frequency of visible plumes.

Response: Experience with an LMS-100 installation for another project, the Basin Electric Project in South Dakota, has led to changes in cooling tower design for the SVEP. Although these are minor changes, they affect various project operating parameters. Attachment VP-2 is a redline-strikethrough version of portions of the AFC (portions of Chapters 2.0, 7.0, and 8.15), reflecting these changes in design.

The following is brief description of the effects of the cooling tower design change in the 16 AFC Environmental Resources disciplines:

Air Quality—The proposed changes to the cooling tower will result in a slight decrease of PM_{10} emissions. Since PM_{10} emissions will be less than what was originally proposed and the project design originally proposed did not produce any air significant quality impacts, there was no need to update the air quality modeling.

Biological Resources—There would be no significant change in project effects.

Cultural Resources—There would be no significant change in project effects.

Geological Hazards and Resources—There would be no significant change in project effects.

Hazardous Materials Handling—Quantities of hazardous materials handling and handling methods would not change.

Land Use—There would be no significant change in project effects.

Noise—The newly designed cooling tower would not differ appreciably in noise emissions from the previous design.

Paleontological Resource—There would be no significant change in project effects.

Public Health—The proposed changes to the cooling tower will result in a net decrease in the emissions of hazardous air pollutants, compared with the design proposed in the Application for Certification. Because modeling of hazardous air pollutants conducted for the AFC showed that the cooling tower would not cause a health risk, it is not necessary to revise the cooling tower modeling.

Socioeconomics—There would be no significant change in project effects.

Soils and Agriculture—There would be no significant change in project effects.

Traffic and Transportation—There would be no significant change in project effects.

Visual Resources—The newly designed cooling tower would appear slightly different, as it would be made of fiberglass, instead of wood, and would be approximately one foot taller than the previous model. The effects of this change on visual resources would be minor and negligible, however. Visual resources analyses conducted for the AFC determined that the project features most visible to the public are the combustion turbine generator enclosures, SCR housings, exhaust stacks, and VBV silencer stacks and also determined that the project as proposed would not cause adverse visual impacts, based on simulated views of the project at key observation points (KOPs). Although the cooling tower is visible from one of the KOPs, a change in the structure's height of one foot would barely be noticeable.

Waste Management—There would be no significant change in the management of project wastes.

Water Resources—The project's use of water would change slightly. The attached redline-strikethrough version of applicable revised AFC sections (Chapters 2.0, 7.0, and 8.15) identifies these changes in detail. The overall effect on the project's water use, however, would be negligible. The amounts of water used and discharged would not significantly change. Project wastewater discharges would not violate applicable water quality standards.

Worker Health & Safety—There would be no significant change in project effects.

Attachment VP-1

Visible Plume Analysis

Cooling Tower Plume Modeling Analysis for the Edison Mission Energy Walnut Creek Energy Park

Prepared by:

Atmospheric Dynamics, Inc.
2925 Puesta del Sol Rd.
Santa Barbara, CA 93105

August 29, 2006

Cooling Tower Plume Modeling Analysis
Edison Mission Energy – Walnut Creek Project

Introduction

This report was prepared to summarize an analysis of the potential for visible water vapor plumes to form above the cooling tower at the proposed Walnut Creek Energy Park. This study supports various environmental documents that have been prepared for the Application for Certification before the California Energy Commission for this project.

EME is proposing to use a five (5) cell wet mechanical-draft cooling tower to reject heat to the atmosphere. The air leaving the cooling towers is usually saturated with moisture and warmer than the ambient air, causing a wet exhaust plume to be created. The saturated exhaust plume may be or may not be visible depending on the specific meteorological conditions. The potential for visible plume formation is also based on cooling tower operational factors that can occur in conjunction with existing meteorological conditions. Visible plume formation from the five (5) natural gas-fired turbines is not expected to occur since the turbine exhaust is hot and contains very little moisture.

Potential issues associated with cooling tower plumes include the presence of visual plumes and the occurrence of ground level fogging and/or icing episodes that involve the ground contact of visible plumes. In order to evaluate the effects on the local and regional environment, a modeling analysis was conducted to simulate the cooling tower plumes from the proposed project using five (5) years of meteorological data.

Modeling Techniques

The Seasonal/Annual Cooling Tower Impact Program (SACTI, Version 11-01-90) was used to assess potential impacts from the cooling tower. SACTI was developed by Argonne National Laboratory[1] for the Electric Power Research Institute (EPRI) to address the following potential adverse impacts of cooling towers:

- plume visibility
- deposition of cooling tower drift
- ground-level fogging and icing
- shadowing by the plume & reduction of solar energy

[1] Argonne National Laboratory, 1984. Users Manual: Cooling-Tower -Plume Prediction Code. Prepared for Electric Power Research Institute, 3412 Hillview Avenue, Palo Alto, CA 9404, EPRI CS-3403-CCM, April, 1984.

SACTI contains algorithms for both natural and mechanical draft cooling towers arranged singly or in clusters. Plume merging and associated enhanced plume rise are treated by the routines contained in the model. While the SACTI model does not have any official regulatory endorsement, this model has been applied for a large number of projects where cooling tower impact assessments were required. The characteristics of the tower and the preparation of the meteorological data set are discussed below.

The characteristics of the proposed cooling tower are listed in Table 1. These input parameters were obtained from Edison Mission Energy's engineering consultant based on preliminary seasonal design data for the facility.

A five (5) year meteorological data set was constructed using hourly surface observations from the Ontario International Airport meteorological station, located near the proposed project location, for the years 2001 through 2005. As discussed below, night-time hours were removed from the meteorological data set, as were day-time hours for which weather or other phenomena would impair visibility. Figure 1 displays a wind rose constructed from all hours of the five (5) year data. The average wind speed is 3.5 m/s and high winds greater than 6 m/s occur 11 percent for the five year data set. Wind speeds either missing or less than the threshold of the anemometer at Ontario occur for 33% of the time period. A lack of precision for light winds is not expected to unduly influence the outcome of the modeling for ground-level fogging as such fogging effects require plume touchdown and would typically be associated with high wind conditions.

Given the length of time of the data used in the SACTI analysis, the data used are considered representative of the climatic conditions of the area where plume formation can occur. Even with this representative data set, short-term variability in conditions can affect the prediction of cooling tower plume impacts. Therefore, the results of the analysis are considered an indicator of likely occurrence and not an absolute predictor of events.

Modeling Results

Cooling Tower

SACTI was applied to simulate plumes from the proposed cooling towers using the five (5) year meteorological data set and tower design characteristics described previously. Default options were assumed for the input variables controlling the model's operation. The five (5) year data set was input into SACTI to produce a five (5) year average frequency distribution for condensed plume length, condensed plume height, plume shadowing, and ground-level fogging. Although the model provides information on plume shadowing and drift deposition, the focus of our analysis and the discussion that follows is on visible plume dimensions and ground based fogging.

Table 1. Cooling Tower Input Parameters

Parameter	Value
Type	linear mechanical draft 1 tower, 5 cells
Heat Dissipation Rate (MW)	200
Circulation Rate (gpm)	34,000
Total Tower Air Flow (kg/s)	6107 – 6294
Max Drift Rate (%)	0.0005
Salt Concentration (gm/gm)	2.03E-3
Orientation	One banks of 5 in-line cells aligned east to west
Height (m)	12.2
Equivalent Total Cell Diameter (m)	20.4
Exit Velocity & Temperature	variable, calculated by the model assuming saturation conditions

Conditions favoring a long condensed plume occur more frequently in the fall and winter seasons as atmospheric conditions, such as air temperature and relative humidity, are more favorable during these periods for plume formation. Also, plume formation tends to occur more frequently during night-time hours and during adverse weather conditions. Since EME has committed to a lighting plan that minimizes illumination, these cooling tower plumes would not be visible at night. Unless illuminated by on-site sources, these cooling tower plumes would not be visible. The SACTI meteorological data set was modified by removing all nocturnal hours, which accounted for 50% of all the hours in the five (5) year data set. In addition, daytime observations with fog, precipitation, visibility less than 3 miles, or ceiling heights less than 500 feet were excluded from the meteorological data set as, under these conditions, a visible plume from the cooling tower would be obscured by these local weather phenomena. For the Ontario meteorological data set, these adverse weather conditions account for 8.8% of the total valid (daylight hours) observations. Table 2 summarizes these statistics.

Table 2	**Total hours**	**Day hours**	**Night Hours Removed from Analysis**	**Limited Visibility Hours Removed from Analysis**	**Total Hours Modeled With SACTI**
Year					
2001	3275	1522	1753	156	1366
2002	8578	4295	4283	315	3680
2003	8607	4332	4275	259	4073
2004	8630	4320	4310	501	3819
2005	8659	4361	4293	423	3938

Thus, the five (5) year meteorological data set was modified by removing both night-time hours and hours with weather obscuring phenomena. In total, these conditions accounted for 54% of all the hours (day, night, and obscuring weather) in the data set. The SACTI was then applied to the remaining data set to assess the cooling tower plumes under daytime conditions when a condensed plume would most likely also be a visible plume. Of particular interest was the analysis of visible plume formation during the months when such formation is most likely, namely the fall and winter seasons. The occurrence of low temperatures coupled with high(er) relative humidity occurs with a greater frequency during these seasons. Plume formation is favored during these types of low temperature/high humidity conditions since the ability of the atmosphere to absorb water vapor is greatly reduced because the air mass is at or near saturation.

The results of the cooling tower analysis are summarized in Attachments 1-5 for the tower for the annual and seasonal seasons. The attachments present the frequency distributions of the primary model output variables, namely plume length and height, which are listed by downwind sector and radial distance from the center of the cooling tower array.

Cooling Tower Plume Formation

The SACTI results for all seasons are summarized in Table 3 below. The annual values indicate that the majority of visible plume lengths will be less than 40 meters (130 feet). Modeling results indicate that plume formation will occur 20% of the time during valid visible hours only at locations within the facility boundary during all seasons. Larger downwind visible plume lengths (annually) are possible, but the downwind visible plume length will be less than 70 meters (230 feet) for 90 percent of all the hours where a visible plume will form. This results in a plume length exceeding 70 meters for only 4.4 percent of the time during the season. When translated into total hours for the season, on average, 161 hours per year will have plume lengths up to but not exceeding 230 feet. SACTI also predicts that the probability that a visible plume height averages 40 meters, and has a median radius of 20 meters (60 feet). For the winter season, the average plume length (when visible) will be similar, at 35meters (105 feet). For winter, SACTI predicts an average visible plume height of 35 meters with a median radius of 25 meters (80 feet), similar to the annual values.

TABLE 3 Seasonal Plume Characteristics from SACTI

	Annual	Winter	Spring	Summer	Fall
Plume Characteristics (m)					
Median Length	40	35	40	40	40
Median Height	40	35	40	45	40
Median Radius	20	25	25	20	20

Ground level fogging

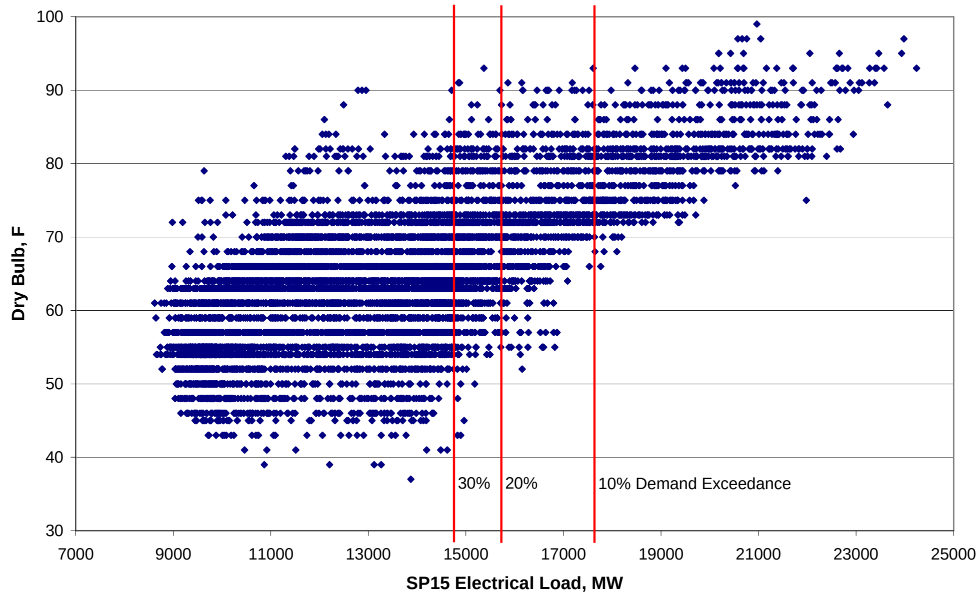
The potential for ground-level fogging on nearby areas was also assessed with SACTI. Potential fogging conditions can occur when atmospheric conditions allow the cooling tower plume to generate a cloud that contacts the ground. This can occur under periods of high humidity or high wind speed and favorable temperatures and stabilities with the fog being nucleated or generated by the cooling tower plume. Should fog be generated across a highway or other thoroughfare, it may become a potential hazard, and mitigation measures such as signs and traffic assistance may be needed. In order for fogging to affect roadway operations, the cooling tower plume must touch down on the road surface and be condensed. This requires high winds (low plume rise), the right wind direction, low dew-point depression, and low temperatures.

SACTI was run with all hours of the five (5) year data base, including nighttime and low-visibility hours. There were no hours of predicted fogging from the cooling tower, considering all wind directions.

Project Operation

The SACTI model was modified to produce an output listing of the meteorological conditions that produced a visible plume. The SACTI cooling tower plume modeling output shows that a visible plume generally only occurs when relative humidity exceeds 85%. In order to evaluate the likelihood of this atmospheric condition coinciding with plant operation, hourly electric load data from the California ISO for the SP15 zone (effectively SCE's and SDG&E's service area) for the period of November 2002 through October 2003 was obtained, and hourly weather data for Fullerton, CA for the same period was obtained. As one would expect, regional electrical loads are highest when dry bulb temperatures are highest due to air-conditioner use on hot summer days, as illustrated in the chart below.

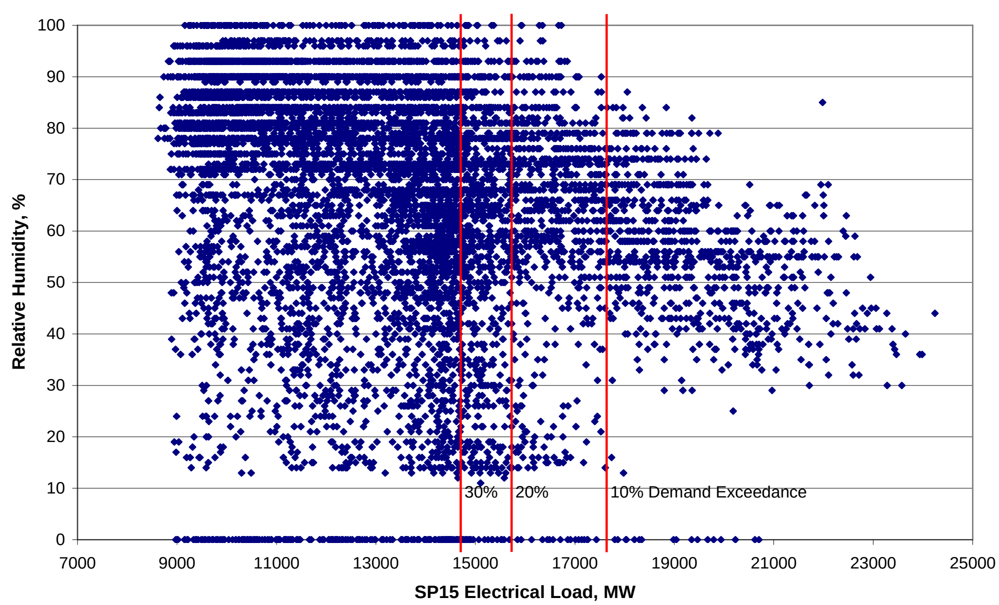
November 2002 - October 2003 Electrical Demand vs Weather Data for Fullerton, CA



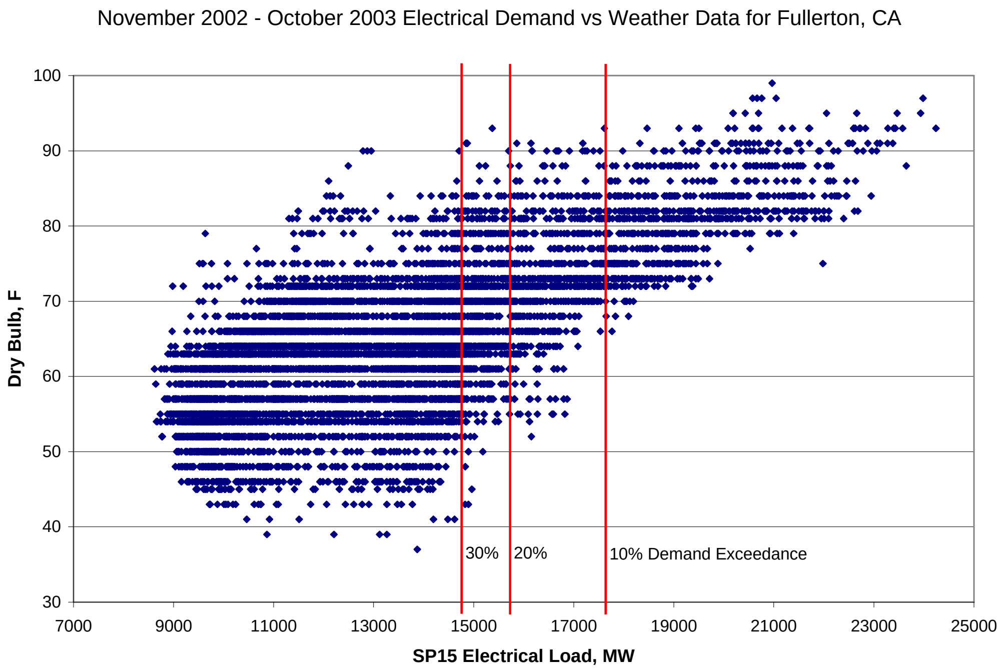
The vertical red lines indicate the SP15 electrical loads that are exceeded 10%, 20% and 30% of the time (i.e., 10%, 20% and 30% of the data points are to the right of the respective lines). Although a peaking powerplant may occasionally be called on to run to alleviate a power grid emergency or unexpected outage of a baseload powerplant, almost all operation of peaking powerplants will be during the highest electrical loads.

On hot summer days, as dry bulb temperatures (and corresponding electrical loads) increase to afternoon peaks, relative humidity naturally decreases due to the increased moisture-holding ability of the warmer air. It would be expected, then, that high electrical loads would correlate negatively with high relative humidity. The chart below is a plot of the same electrical loads as those in the preceding chart, but versus the relative humidity prevailing at the time of those loads, and illustrates the expected negative correlation.

November 2002 - October 2003 Electrical Demand vs Weather Data for Fullerton, CA



The chart below is a frequency distribution of the relative humidity during the hours corresponding to the highest 20% of electrical loads. Relative humidity only exceeds the 85% level at which visible plume may occur during 3.8% of the hours in which the highest 20% of electrical loads occurred during the one year period for which data was obtained. Expressed as a percent of the entire year, 3.8% of 20% of the year is an incidence of less than 0.8%.



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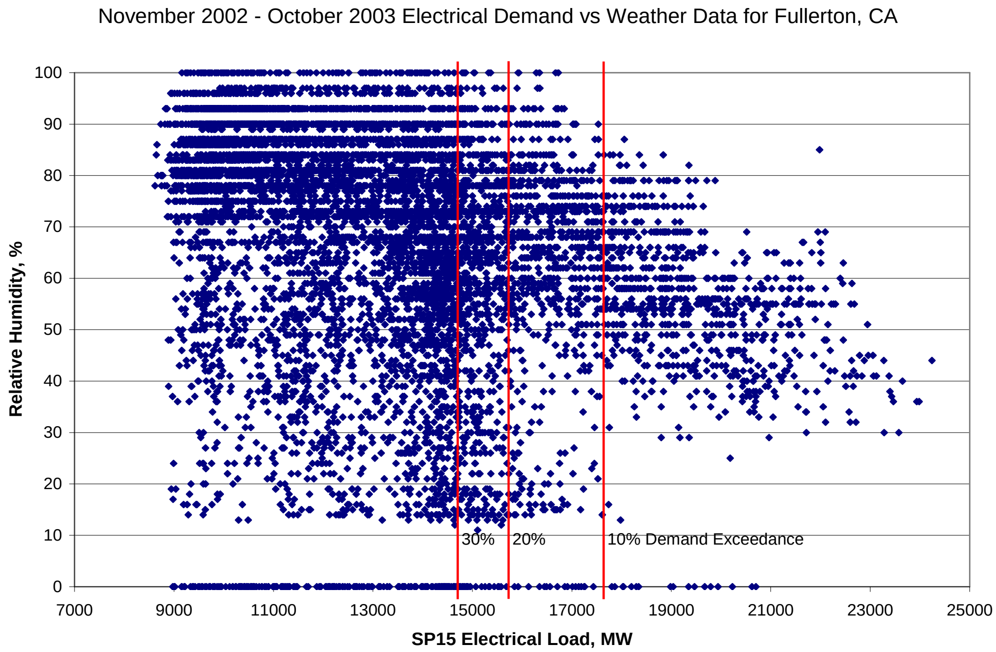

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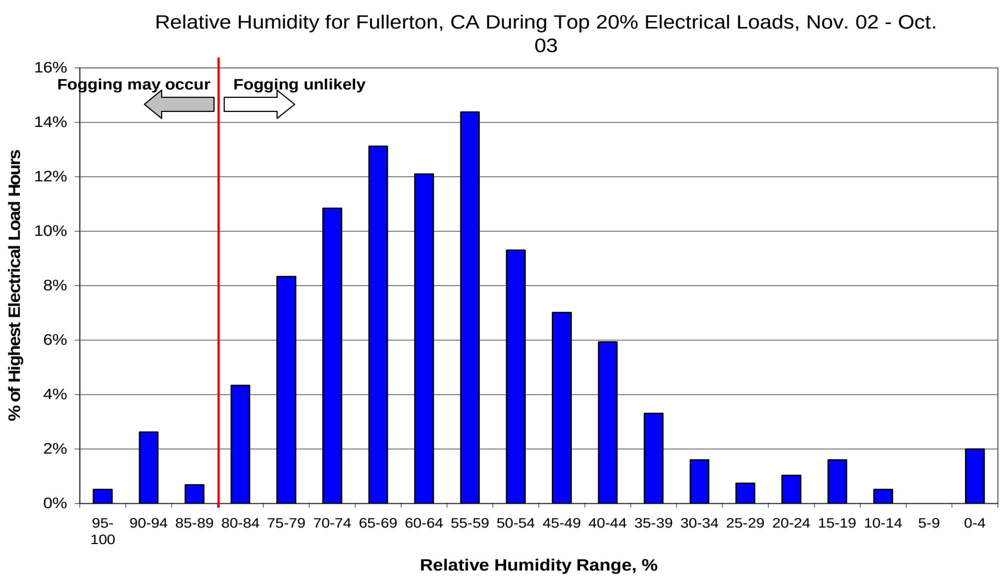
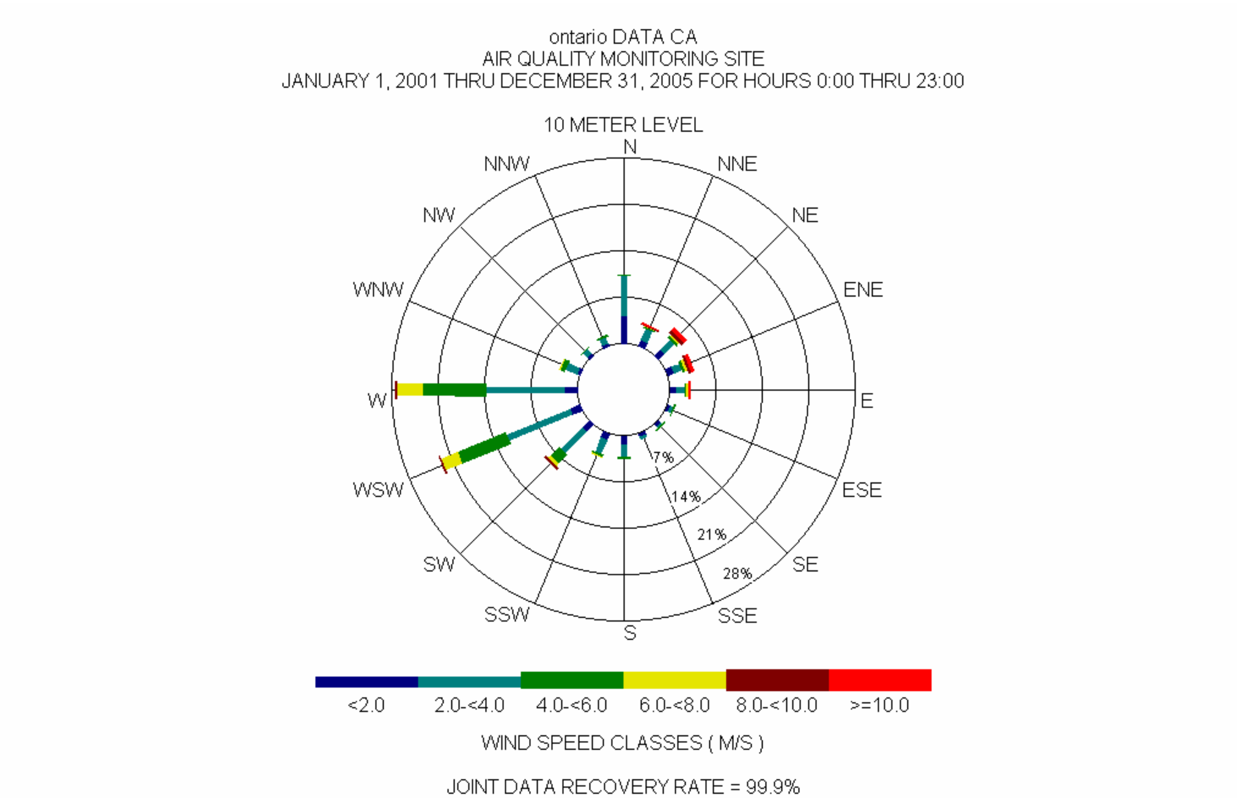


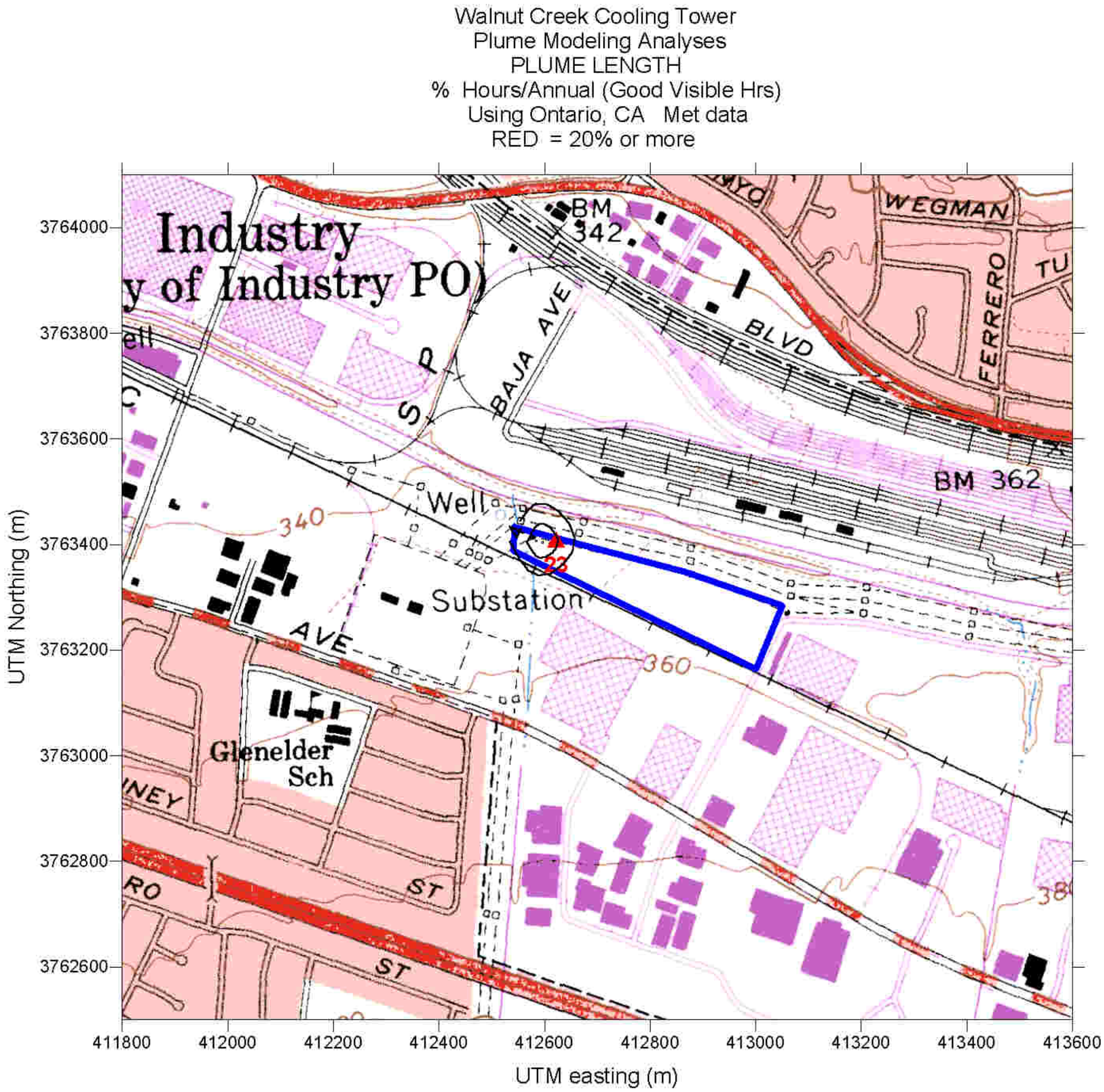
Summary

A cooling tower modeling analysis was conducted using SACTI and five (5) years of Ontario Airport meteorological data. Model simulations indicate that visible plumes will occur, but will be moderate in size (height and length). The 20 percent visible plume significance levels will only be equaled or exceeded immediately adjacent to the cooling tower with the 20 percent plume being contained on-site. The probability of formation of long visible plumes in excess of

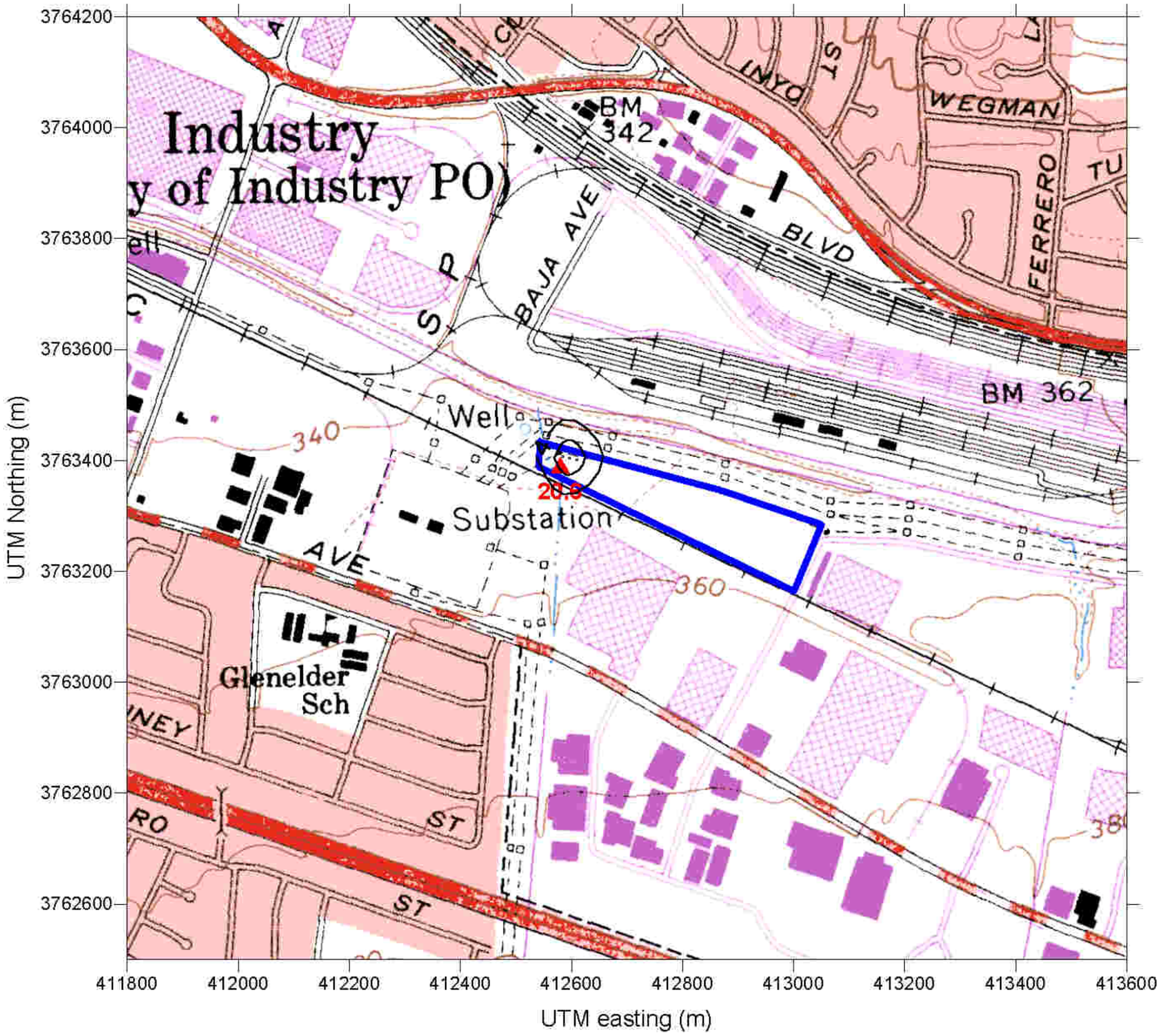
230 feet is less than five percent. No plume fogging is also predicted to occur in the general vicinity of the project site. Analysis of the conditions under which visible plumes might be likely to form, in addition, shows that these conditions occur very infrequently when there are very high electrical loads corresponding to times when a peaking power plant such as the WCEP would be likely to operate (approximately 0.8 percent of the time) and therefore, no significant adverse impacts would result from the project.

Figure 1
Annual Wind Rose (2001-2005)
Ontario, CA Airport

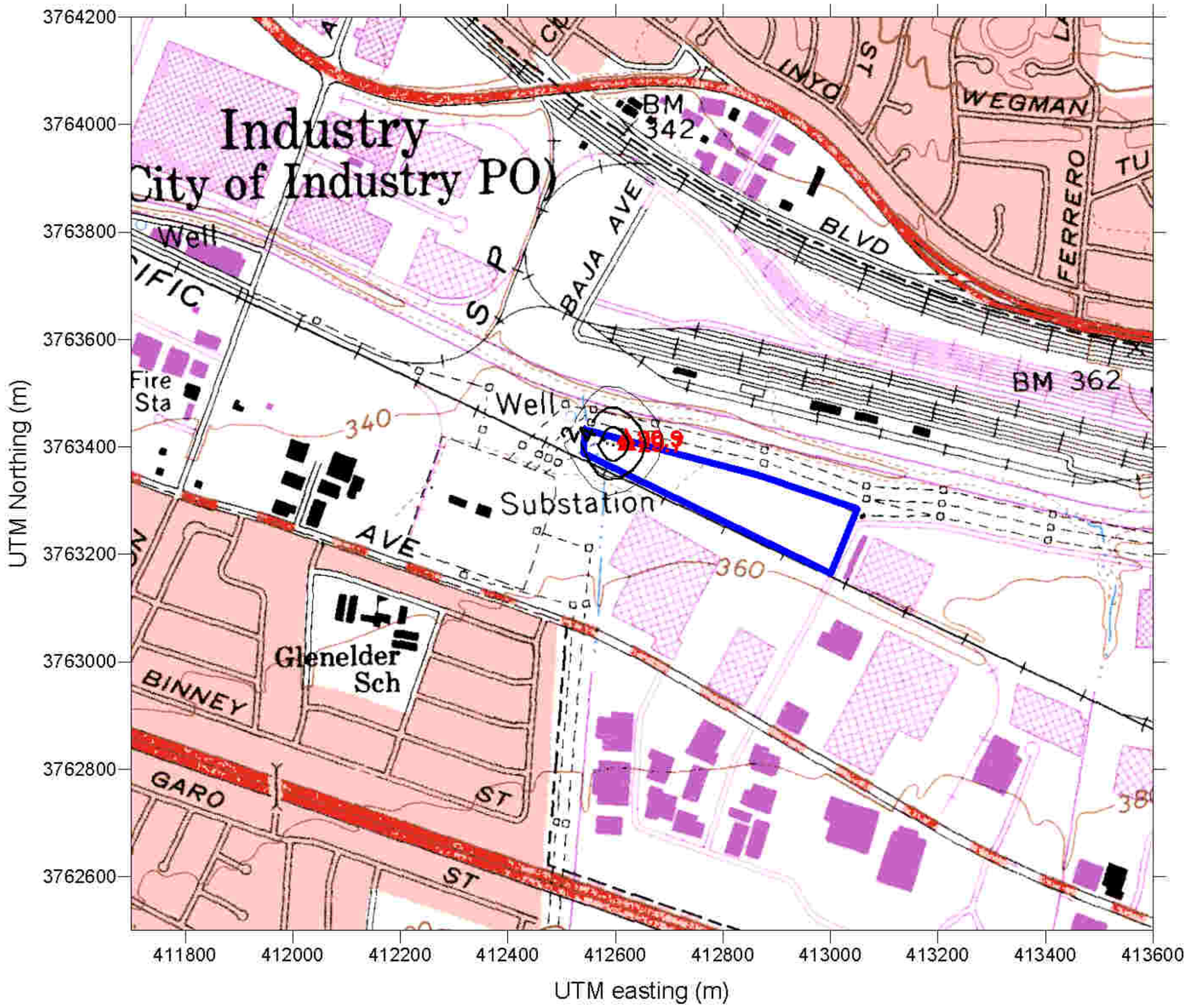



Walnut Creek Cooling Tower
Plume Modeling Analyses
PLUME LENGTH
% Hours/Annual (Good Visible Hrs)
Using Ontario, CA Met data
RED = 20% or more
UTM Northing (m)
UTM easting (m)
3764000
3763800
3763600
3763400
3763200
3763000
3762800
3762600
411800
412000
412200
412400
412600
412800
413000
413200
413400
413600
Industry
y of Industry PO)
BM 342
WEGMAN
BLVD
FERRERO
BAJA AVE
BM 362
Well
340
360
Substation
AVE
Glenelder Sch
ST
23

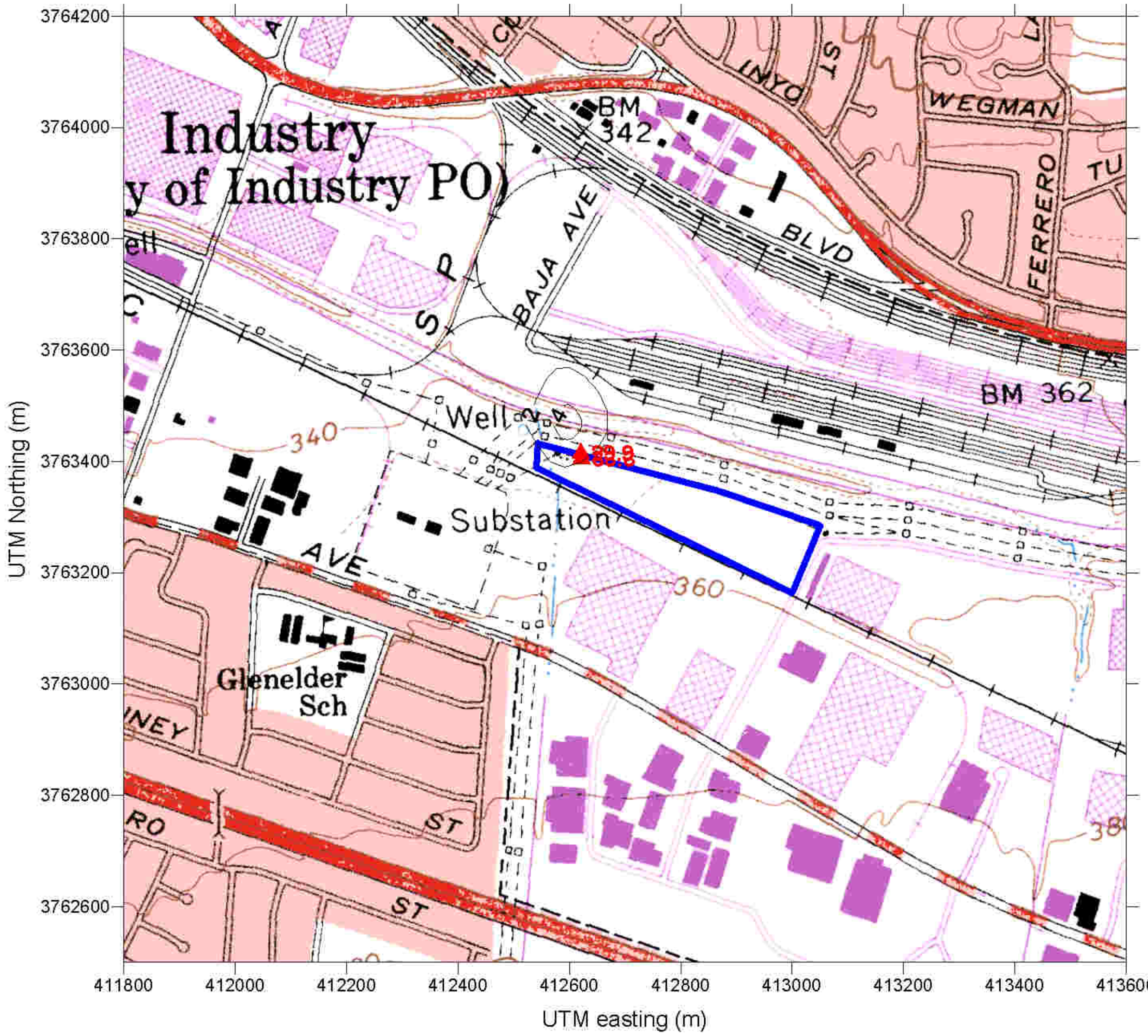
Walnut Creek Cooling Tower
Plume Modeling Analyses
PLUME LENGTH
% Hours/Winter (Good Visible Hrs)
Using Ontario, CA Met data
RED = 20% or more



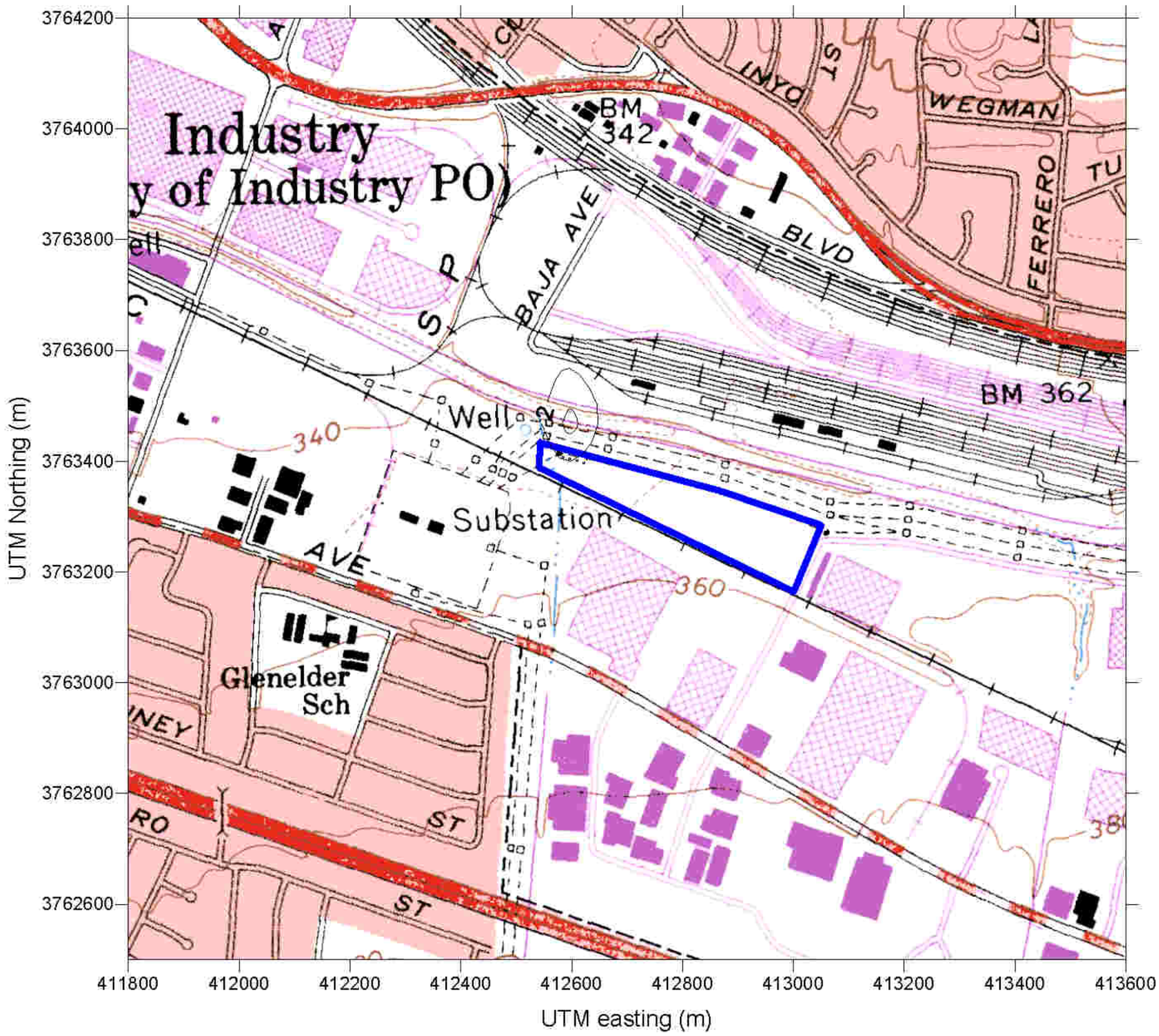
Walnut Creek Cooling Tower
Plume Modeling Analyses
PLUME LENGTH
% Hours/Spring (Good Visible Hrs)
Using Ontario, CA Met data
RED = 20% or more



Walnut Creek Cooling Tower
Plume Modeling Analyses
PLUME LENGTH
% Hours/Summer (Good Visible Hrs)
Using Ontario, CA Met data
RED = 20% or more



Walnut Creek Cooling Tower
Plume Modeling Analyses
PLUME LENGTH
% Hours/Fall (Good Visible Hrs)
Using Ontario, CA Met data
RED = 20% or more



Attachment VP-2

Revised AFC Pages

SECTION 2.0

Project Description

The Walnut Creek Energy Park (WCEP) will be a nominal 500-megawatt (MW) peaking facility consisting of five GE Energy LMS100 natural gas-fired turbine-generators and associated equipment. The facility will be located at 911 Bixby Drive in the City of Industry (City), Los Angeles County, California, on an 11.48-acre parcel currently owned by the Industry Urban Development Agency (Development Agency). The parcel is entirely covered with a large warehouse building and asphalt paving and is currently in use as a commercial distribution warehouse. The Development Agency has planned this parcel for redevelopment and plans to demolish the existing structure in the near future. Edison Mission Energy has entered into a lease option agreement for the project site. The lease option will be assigned to and exercised by Walnut Creek Energy, LLC (WCE), who will take physical possession of the site from the Development Agency after this demolition has taken place. The City is in the process of reviewing a Negative Declaration for the demolition in order to make the parcel available for a higher-value industrial use.

The WCEP will be located in an area zoned for industrial uses. The legal description of the project site is provided in Appendix 1A. The project site is located within the boundaries of the La Puente Mexican land grant rancho and so does not have a township, range, and section designation. The County Assessor's parcel designation is Los Angeles County 8242-013-901. Mailing address labels for all property owners within 1,000 feet of the site boundaries or 600 feet of the project linears are provided in Appendix 1B. Figure 2.1-1 shows the project site plan and appurtenant facilities, including the electric transmission line, natural gas supply line, reclaimed water supply line, potable water supply line, and waste water disposal line. Three of these appurtenant facilities will connect to utility lines located on easements within the project parcel (natural gas, sanitary sewer, non-reclaimable waste water). Two others (reclaimed water and potable water) will connect to utility lines located within a few feet of the project boundary.

WCEP will connect to Southern California Edison's (SCE) electrical transmission system at the Walnut Substation, which is approximately 250 feet south of the project site. This connection will require 600 feet of 230-kilovolt (kV) transmission line and two transmission towers to be located adjacent to the substation within SCE's transmission corridor. Interconnection at this specific substation minimizes downstream impacts to the SCE's transmission system while providing efficient peaking power for use during peak demand as projected by SCE.

Reclaimed water for cooling tower and evaporative cooler makeup, site landscape irrigation, and demineralized water makeup will be supplied via a direct connection to a 12-inch-diameter reclaimed water pipeline at the corner of Bixby Drive and Chestnut Street, adjacent to the project entrance, through a 12-inch-diameter pipe extending approximately 30 feet from the project boundary into Bixby Drive. The Rowland Water District **(RWD)** will supply, on average, approximately **871** ~~827~~ acre-feet per year (afy) of reclaimed water for the project from the San Jose Creek Wastewater Reclamation Plant **supplemented by impaired well water. RWD**

currently operates two wells which discharge into the RWD reclaim water system grid. One well, known as the Carrier Well, pumps at a relatively constant 300 gpm rate. The second well is intermittent. Appendix 7A contains a "will-serve" letter from the District.

The project will connect with Southern California Gas Company's (SoCalGas's) natural gas pipeline via a 14-inch-diameter connection to a 30-inch-diameter high-pressure pipeline that runs in a utility easement within the WCEP parcel.

Potable water for drinking and sanitary uses will be provided through a 30-foot-long, 4-inch-diameter connection to the Rowland Water District's 12-inch water main in Bixby Drive, immediately adjacent to the project site.

Sanitary waste water will be discharged to the Los Angeles County Sanitation District (LACSD) No. 21, Section 3, 48-inch trunk sewer line, which runs in a utility easement within the project site. Process waste water will also be discharged to this sanitary sewer line through a 4-inch-diameter connecting pipe to the trunk sewer line. The sewer line is located within the utility easement adjacent to the railroad track and within the southern boundary of the project site.

2.1 Generating Facility Description, Design, and Operation

This section describes the facility's conceptual design and proposed operation.

2.1.1 Site Arrangement and Layout

Figure 2.1-1 shows the general arrangement and layout of the facility, and Figures 2.1-2a and 2.1-2b are typical elevation views. Primary access to the site will be provided via Bixby Drive. The project site is located in an industrial area and is surrounded to the south, east, and west, by warehousing and other industrial uses. To the north is an SCE utility corridor for 66-kV transmission lines. Beyond the corridor is the San Jose Creek Flood Control Channel, and beyond that to the north, an intermodal rail/truck terminal. Residential areas are located in the City of La Puente to the north, beyond the industrial areas that are adjacent to the project site, and in unincorporated areas of the Los Angeles County community of Hacienda Heights to the south.

2.1.2 Process Description

The generating facility will consist of five GE Energy LMS100 natural gas-fired combustion turbine-generators (CTGs), each equipped with water injection capability to reduce oxides of nitrogen (NO_x) emissions, selective catalytic reduction (SCR) equipment containing catalysts to further reduce NO_x emissions, and an oxidation catalyst to reduce carbon monoxide (CO) emissions. The total net generating capacity will be 500 MW. Auxiliary equipment will include an inlet air filter house with evaporative cooler, turbine inter-cooler, 5-cell mechanical-draft cooling tower and circulating water pumps, natural gas compressor, generator step-up and auxiliary transformers, and water storage tanks.

Each CTG will generate approximately 100 MW gross at the summer design ambient conditions. The project is expected to have an annual capacity factor of approximately 20 to 40 percent, depending on dispatch to meet customer loads. The generating facility base case heat balance is shown on Figure 2.1-3. This balance is based on an ambient dry bulb temperature of 84 degrees Fahrenheit (°F) (the summer average condition) with evaporative cooling of the inlet combustion air.

Associated equipment will include emission control systems necessary to meet the proposed emission limits. NO_x emissions will be controlled to 2.5 parts per million by volume, dry basis (ppmvd) corrected to 15 percent oxygen with the combination of water injection in the CTGs and selective catalytic reduction (SCR) systems in the catalyst housing. A CO catalyst will also be installed in the catalyst housing to limit CO emissions from the CTGs to 6 ppmvd at 15 percent oxygen.

2.1.3 Generating Facility Cycle

CTG combustion air flows through the inlet air filter and evaporative cooler and associated air inlet ductwork. The air is then compressed in the gas turbine low-pressure compressor section and cooled through the off-base intercooler before it enters the high-pressure compressor. The compressed air then flows to the CTG combustor. Natural gas fuel is injected into the compressed air in the combustor and ignited. The hot combustion gases expand through the power turbine sections of the CTGs, causing them to rotate, driving the electric generators and CTG compressors. Integrating an intercooler between compressor stages in the LMS100, together with higher combustor firing temperatures, has resulted in gross turbine generator efficiencies of approximately 44 percent. The hot combustion gases exit the turbine sections at approximately 770°F and then pass through the catalyst housing for exposure to NO_x and CO emissions catalysts, and then exit the exhaust stacks.

2.1.4 Combustion Turbine Generators

Electricity is produced by the five CTGs. The following paragraphs describe the major components of the generating facility.

2.1.4.1 Combustion Turbine Generators

Thermal energy is produced in the CTGs through the combustion of natural gas, which is converted into mechanical energy required to drive the combustion turbine compressors and electric generators. Five GE Energy LMS100 CTGs have been selected for WCEP. The LMS100 integrates features of GE Energy's frame and aeroderivative CTG design systems. The low-pressure compressor is derived from the heavy-duty frame engine system and the high pressure compressor, combustor, and power turbine are derived from the aeroderivative system. Each CTG consists of a stationary combustion turbine-generator, and associated auxiliary equipment. The CTGs will be equipped with water injection capability to control NO_x emissions formed in the combustion process. While GE Energy anticipates future units will be capable of using steam injection and Dry Low Emissions (DLE) combustors, these design options are not as suitable for peaking operation. Each CTG will also have a variable bleed valve vent that allows the venting of compressed air to the atmosphere under certain transient compressor operating conditions.

The CTGs will be equipped with the following required accessories to provide safe and reliable operation:

- Evaporative coolers
- Inlet air filters

- Metal acoustical enclosure
- Duplex shell and tube lube oil coolers for the turbine and generator
- Annular combustor combustion system
- Compressor wash system
- Fire detection and protection system
- Compressor intercooler
- Hydraulic starting system
- Water injection system
- Compressor variable bleed valve vent

The metal acoustical enclosure, which contains the CTGs and accessory equipment, will be located outdoors.

2.1.4.2 Catalyst Housing

The catalyst housings, one for each CTG, are equipped with catalyst modules to further reduce emissions. The SCR emission control system will use ammonia vapor in the presence of a catalyst to reduce CTG exhaust gas NO_x. Diluted ammonia (NH_3) vapor will be injected into the exhaust gas stream via a grid of nozzles located upstream of the catalyst module. The subsequent chemical reaction will reduce NO_x to nitrogen and water, resulting in a NO_x concentration in the exhaust gas no greater than 2.5 ppmvd at 15 percent oxygen (on a 3-hour average basis).

An oxidation catalyst will also be installed within the housing to reduce the concentration of CO in the exhaust gas emitted to atmosphere to no greater than 6 ppmvd at 15 percent oxygen. The exhaust from each catalyst housing will be discharged from individual 90-foot-tall, 13.5-foot diameter exhaust stacks.

2.1.5 Major Electrical Equipment and Systems

The bulk of the electric power produced by the facility will be transmitted to the power grid through the 230-kV connection with the SCE Walnut Substation. A small amount of electric power will be used onsite to power auxiliaries such as pumps, natural gas compressors, cooling tower fans, control systems, and general facility loads including lighting, heating, and air conditioning. Some will also be converted from alternating current (AC) to direct current (DC), and will be used as backup power for control systems and other uses.

Power will be generated by the five CTGs at 13.8 kV and stepped up by five fan-cooled generator step-up transformers to 230 kV for transmission to the grid. Auxiliary power will be back-fed through two of the step-up transformers. Once the units are running, they will supply their own auxiliary power. Surge arresters will be provided at the high-voltage bushings to protect the transformers from surges on the 230-kV system caused by lightning strikes or other system disturbances. The transformers will be set on concrete pads within berms designed to contain the non-PCB transformer oil in the event of a leak or spill. Fire protection systems will be provided. The high-voltage side of the step-up transformers will be connected to gas insulated (SF6) circuit breakers then to overhead cables to SCE's substation. From the substation, power will be transmitted to the grid via transmission lines owned by SCE. The transmission connect to the SCE Walnut Substation is approximately 600 feet long and will require a two conductor support towers, to be located adjacent to the

Walnut Substation within SCE's existing transmission corridor easement. Section 5.0, Electrical Transmission contains additional information regarding the electrical transmission system as well as a summary of the System Impact Study.

2.1.6 Fuel System

The CTGs will be designed to burn natural gas. Natural gas requirements at the summer average condition of 84ºF are approximately 870 million British thermal units per hour (MMBtu/hr), per unit, on a higher heating value (HHV) basis.

Natural gas will be delivered to the site via a connection to the existing 30-inch pipeline located in a utility easement within the project parcel. The natural gas will flow through gas scrubber/filtering equipment, gas compressors, a gas pressure control station, and a flow-metering station prior to entering the combustion turbines. Historical data indicates that gas pressure in SoCalGas's Line 2001 varies between 400 and 600 pounds per square inch gauge (psig). Because of a high compressor pressure ratio, the GE Energy LMS100 unit requires a pressure at the turbine connection of 960 psig, plus or minus 20 psig. Three, 50-percent-capacity onsite electric motor-driven gas compressors will be used to boost the pipeline pressure to the level required by the gas turbine. Additional information about natural gas supply can be found in Section 6.0, Natural Gas Supply.

2.1.7 Water Supply and Use

This section describes the quantity of water required, the source of the water supply, and water treatment requirements. Additional information on water supply and use is found in Section 7.0, Water Supply.

2.1.7.1 Water Requirements

The estimated water usage for the plant is provided in Table 2.1-1.

TABLE 2.1-1
Raw Water Usage

Condition	Expected Usage	
Peak Usage	**1,984** ~~1,528~~ gpm	**1,074** ~~937~~ac-ft/yr[a]
Average Annual Usage	**1,450** ~~1,460~~ gpm	**885** ~~771~~ ac-ft/yr[b]

[a] At 39 percent capacity factor
[b] At **29** ~~32~~ percent capacity factor

gpm = gallons per minute
ac-ft/yr = acre-feet per year

2.1.7.2 Water Supply

Reclaimed water **for circulating system makeup**, CTG evaporative cooling, landscape irrigation, process system makeup, and cooling will be provided by the Rowland Water District via the existing 12-inch-diameter reclaimed water supply line. ~~Water used for makeup in the circulating water system will be fed directly from the reclaimed water supply line~~ **Reclaim water will be fed** into one **nominal 180,000-** ~~150,000-~~gallon chlorine contact tank followed by one **180,000-** ~~150,000-~~gallon aboveground reclaimed water storage tank. The chlorine contact tank will provide a minimum of 90 minutes contact time and the reclaimed water storage tank will provide approximately 1.5 hours of operational storage in the event there is a disruption in the supply. Water supply reliability is ensured by the Rowland Water District's extensive reclaimed water storage facilities.

2.1.7.3 Water Quality and Treatment

Process water includes the demineralized water used for NO_x injection into the CTG and for evaporative cooling. Potable water will be furnished from the city's water system for drinking and sanitary use and makeup to the plant hose stations.

Water treatment will be provided onsite prior to use for water injection. Demineralized water will be used for NO_x injection water. It will be produced by a reverse osmosis (RO) and Ion Exchange (IX) system and will be stored in a 100,000-gallon demineralized water storage tank. Water quality is described further in Sections 7.0, Water Supply, and 8.15, Water Resources.

WCEP water use can be divided into the following three levels based on the quality required: (1) cooling water, (2) demineralized water for NO_x injection water, and (3) potable water.

2.1.7.4 Cooling Tower System

Makeup water will be pumped from the reclaimed water storage tank to the cooling tower basins as required to replace water lost from evaporation, drift, and blowdown. A chemical feed system will supply water conditioning chemicals to the circulating water to minimize corrosion and control the formation of mineral scale and biofouling. Sulfuric acid will be fed into the circulating water system in proportion to makeup water flow for alkalinity reduction to control the scaling tendency of the circulating water. The acid feed equipment will consist of a bulk sulfuric acid storage tank and two full-capacity sulfuric acid metering pumps.

To further inhibit scale formation, a polyacrylate solution will be fed into the circulating water system as a sequestering agent in an amount proportional to the circulating water blowdown flow. The scale inhibitor feed equipment will consist of a chemical solution bulk storage tank and two full-capacity scale inhibitor metering pumps.

To prevent biofouling in the circulating water system, sodium hypochlorite will be fed into the system. The hypochlorite feed equipment will consist of a bulk storage tank and two full-capacity hypochlorite metering pumps. A small storage tank, or 250-gallon totes, and two full-capacity metering pumps will be provided for the feeding of either stabilized bromine or sodium bromide as alternate biocides.

2.1.8 Plant Cooling Systems

A cooling tower will be provided for the gas turbine auxiliary cooling requirements. Two 50 percent-capacity circulating water pumps will provide water to cool three closed-cooling water heat exchangers rated at approximately 33 percent capacity each. The closed-cooling water heat exchangers will provide high quality cooling water to a GE-provided pump skid for each combustion turbine. The pump skid provides cooling water to the CT compressor intercooler and to the lubrication systems.

2.1.9 Waste Management

Waste management is the process whereby all wastes produced at WCEP are properly collected, treated if necessary, and disposed of. Wastes include wastewater, solid nonhazardous waste, and both liquid and solid hazardous waste. Waste management is discussed in more detail in Section 8.14, Waste Management.

2.1.9.1 Wastewater Collection, Treatment, and Disposal

The primary wastewater collection system will collect process wastewater from all of the plant equipment, including the cooling tower and water treatment equipment. The second wastewater collection system will collect sanitary wastewater from sinks, toilets, showers, and other sanitary facilities, and discharge to the city sanitary sewer system. The two wastewater systems are described below.

2.1.9.1.1 Circulating Water System Blowdown

Circulating water system blowdown will consist of the reclaimed makeup water and other recovered process wastewater streams that have been concentrated by evaporative losses in the cooling tower, and residues of the chemicals added to the circulating water. The cooling tower concentrates these streams near the mineral solubility limit for the constituents of concern (calcium, silica, and total dissolved solids [TDS]). This concentrated water must then be removed from the cooling tower via blowdown to prevent the formation of mineral scale in heat transfer equipment. The chemicals added to the circulating water control scaling and biofouling of the cooling tower and control corrosion of the circulating water piping and intercooler. Cooling tower blowdown will be discharged to the 48-inch sanitary sewer trunk line located in a utility easement within the project parcel.

2.1.9.1.2 Plant Drains and Oil/Water Separator

General plant drains will collect area washdown, sample drains, and drainage from facility equipment areas. Water from these areas will be collected in a system of floor drains, hub drains, sumps, and piping and routed to the wastewater collection system. Drains that potentially could contain oil or grease will first be routed through an oil/water separator. Wastewater from combustion turbine water washes will be collected in a holding tank. If cleaning chemicals were not used during the water wash procedure, the wastewater will be discharged to the oil/water separator and then recycled as makeup to the cooling tower. Wastewater containing cleaning chemicals will be trucked offsite for disposal at an approved wastewater disposal facility.

2.1.9.1.3 Solid Wastes

WCEP will produce maintenance and plant wastes typical of natural gas-fueled power generation operations. Generation plant wastes include oily rags, broken and rusted metal and machine parts, defective or broken electrical materials, empty containers, and other solid wastes, including the typical refuse generated by workers. Recyclable materials will be taken offsite. Waste collection and disposal will be in accordance with applicable regulatory requirements to minimize health and safety effects.

2.1.9.1.4 Hazardous Wastes

Several methods will be used to properly manage and dispose of hazardous wastes generated by WCEP. Waste lubricating oil will be recovered and reclaimed by a waste oil recycling contractor. Spent lubrication oil filters will be disposed of in a Class I landfill. Spent SCR and oxidation catalysts will be reclaimed by the supplier or disposed of in accordance with regulatory requirements. Workers will be trained to handle hazardous wastes generated at the site.

Chemical cleaning wastes will consist of detergent solutions used during turbine washing. These wastes, which are subject to high metal concentrations, will be temporarily stored onsite in portable tanks and disposed of offsite by the chemical cleaning contractor in accordance with applicable regulatory requirements.

2.1.10 Management of Hazardous Materials

There will be a variety of chemicals stored and used during the construction and operation of WCEP. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards (LORS). Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals will be stored in storage tanks, and other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to contain leaks and spills. Berm and drain piping design will allow a full-tank capacity spill without overflowing the berms. For multiple tanks located within the same bermed area, the capacity of the largest single tank will determine the volume of the bermed area and drain piping. Drain piping for volatile chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors. After neutralization, if required, water collected from the chemical storage areas will be directed to the cooling tower basin, or trucked offsite for disposal at an approved wastewater disposal facility.

The aqueous ammonia storage area will have spill containment and ammonia vapor detection equipment. Aqueous ammonia will be transported, and stored on site, in a 19 percent solution, by weight.

Safety showers and eyewashes will be provided in the vicinity of all chemical storage and use areas. Hose connections will be provided near the chemical storage and feed areas to flush spills and leaks to the plant wastewater collection system. Approved personal protective equipment will be used by plant personnel during chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material will be stored onsite for spill cleanup.

A list of the chemicals anticipated to be used at the generating facility and their locations is provided in the Hazardous Materials Handling section (Section 8.5). This list identifies each chemical by type, intended use, and estimated quantity to be stored onsite.

2.1.11 Emission Control and Monitoring

Air emissions from the combustion of natural gas in the CTGs will be controlled using state-of-the-art systems. Emissions that will be controlled include NO_x, volatile organic compounds (VOCs), CO, and particulate matter. Section 8.1, Air Quality, includes additional information on emission control and monitoring.

2.1.11.1 NO_x Emission Control

Selective catalytic reduction will be used to control NO_x concentrations in the exhaust gas emitted to the atmosphere to 2.5 ppmvd at 15 percent oxygen from the gas turbines/SCRs. The SCR process will use aqueous ammonia. Ammonia slip, or the concentration of unreacted ammonia in the exiting exhaust gas, will be limited to 5 ppmvd at 15 percent oxygen from the catalyst housing. The SCR equipment will include a reactor chamber, catalyst modules, ammonia storage system, ammonia vaporization and injection system, and monitoring equipment and sensors.

2.1.11.2 Carbon Monoxide

An oxidizing catalytic converter will be used to reduce the CO concentration in the exhaust gas emitted to the atmosphere to 6 ppmvd at 15 percent oxygen from the gas turbines.

2.1.11.3 Particulate Emission Control

Particulate emissions will be controlled by the use of natural gas, which is low in particulates, as the sole fuel for the CTGs.

2.1.11.4 Continuous Emission Monitoring

Continuous emission monitors (CEMs) will sample, analyze, and record fuel gas flow rate, NO_x and CO concentration levels, and percentage of O_2 in the exhaust gas from the three catalyst housing stacks. This system will generate reports of emissions data in accordance with permit requirements and will send alarm signals to the plant distributed control system (DCS) when emissions approach or exceed pre-selected limits.

2.1.12 Fire Protection

The fire protection system will be designed to protect personnel and limit property loss and plant downtime in the event of a fire. Fire water will be supplied via two 10-inch-diameter connection loop tie-ins with an existing main line at the north project boundary. These connections will be sized in accordance with National Fire Protection Association (NFPA) guidelines to provide 2 hours of protection from the onsite worst-case single fire (2,000 gpm).

Fire water from the water main will be provided to a dedicated underground fire loop piping system. Both the fire hydrants and the fixed suppression systems will be supplied from the fire water loop. Fixed fire suppression systems will be installed at determined fire risk areas. Sprinkler systems will also be installed in the Administration/Maintenance Building as required by NFPA and local code requirements. The CTG units will be protected by a carbon dioxide (CO_2) fire protection system. Hand-held fire extinguishers of the appropriate size and rating will be located in accordance with NFPA 10 throughout the facility. The cooling tower will be constructed of wood and will include a fire protection sprinkler system and a wetting pump to keep the wood wet during periods of inactivity. The project will include a diesel fire pump if the Los Angeles County Fire Department determines this to be necessary.

Section 8.5, Hazardous Materials Handling, includes additional information for fire and explosion risk, and Section 8.10, Socioeconomics, provides information on local fire protection capability.

2.1.13 Plant Auxiliaries

The following systems will support, protect, and control the generating facility.

2.1.13.1 Lighting

The lighting system provides personnel with illumination for operation under normal conditions and for egress under emergency conditions, and includes emergency lighting to perform manual operations during an outage of the normal power source. The system also provides 120-volt convenience outlets for portable lamps and tools.

2.1.13.2 Grounding

The electrical system is susceptible to ground faults, lightning, and switching surges that result in high voltage that constitute a hazard to site personnel and electrical equipment. The station grounding system provides an adequate path to permit the dissipation of current created by these events.

The station grounding grid will be designed for adequate capacity to dissipate heat from ground current under the most severe conditions in areas of high ground fault current concentration. The grid spacing will maintain safe step voltage gradients.

Bare conductors will be installed below-grade in a grid pattern. Each junction of the grid will be bonded together by an exothermic weld or compression connection.

Ground resistivity readings will be used to determine the necessary numbers of ground rods and grid spacing to ensure safe step and touch potentials under severe fault conditions.

Grounding stingers will be brought from the ground grid to connect to building steel and non-energized metallic parts of electrical equipment.

2.1.13.3 Distributed Control System

The DCS provides modulating control, digital control, monitoring, and indicating functions for the plant power block systems.

The following functions will be provided:

- Controlling the CTGs and other systems in a coordinated manner
- Controlling the balance-of-plant systems in response to plant demands
- Monitoring controlled plant equipment and process parameters and delivery of this information to plant operators.
- Monitoring the CTG CEMs units for critical alarms, and collecting data for historical log-in.
- Providing control displays (printed logs, operator interface) for signals generated within the system or received from input/output (I/O)
- Providing consolidated plant process status information through displays presented in a timely and meaningful manner
- Providing alarms for out-of-limit parameters or parameter trends, displaying on operator interface units and recording on an alarm log printer
- Providing storage and retrieval of historical data

The DCS will be a redundant microprocessor-based system and will consist of the following major components:

- Liquid crystal display (LCD) flat screen operator displays
- Engineer work station
- Distributed processing units
- I/O cabinets
- Historical data unit
- Printers
- Data links to the combustion turbine

The DCS will have a functionally-distributed architecture comprising a group of similar redundant processing units linked to a group of operator consoles and the engineer work station by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, annunciation, and historical purposes. By being redundant, no single processor failure can cause or prevent a unit trip.

The DCS will interface with the control systems furnished by the CTG supplier to provide remote control capabilities, as well as data acquisition, annunciation, and historical storage of turbine and generator operating information.

The system will be designed with sufficient redundancy to preclude a single device failure from significantly affecting overall plant control and operation. This also will allow critical control and safety systems to have redundancy of controls, as well as an uninterruptible power source.

2.1.13.4 Cathodic Protection

The cathodic protection system will be designed to control the electrochemical corrosion of designated metal piping buried in the soil. Depending upon the corrosion potential and the site soils, either passive or impressed current cathodic protection will be provided.

2.1.13.5 Freeze Protection

Not required.

2.1.13.6 Service Air

The service air system will supply compressed air to hose connections for general plant use. Service air headers will be routed to hose connections located at various points throughout the facility.

2.1.13.7 Instrument Air

The instrument air system provides dry air to pneumatic operators and devices. An instrument air header will be routed to locations within the facility equipment areas and within the water treatment facility where pneumatic operators and devices will be located.

2.1.14 Interconnect to Electrical Grid

The five CTGs will connect with an approximately 600-foot-long 230 kV transmission line to SCE's Walnut Substation.

2.1.15 Project Construction

Construction of the generating facility, from site preparation and grading to commercial operation, is expected to take place from April 2007 to August 2008. Major milestones are listed in Table 2.1-2.

TABLE 2.1-2
Project Schedule Major Milestones

Activity	Date
Begin Construction	Spring 2007
Startup and Test	Spring 2008
Commercial Operation	August 2008

There will be an average monthly and peak monthly workforce of approximately 220 and 408, respectively, of construction craft people, supervisory, support, and construction management personnel onsite during construction (see Table 8.10-8 in the Socioeconomics section).

Construction will be scheduled to occur between 7 a.m. and 7 p.m., Monday through Saturday. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities. During some construction periods and during the startup phase of the project, some activities will continue 24 hours per day, 7 days per week.

The peak construction site workforce level is expected to last from Month 6 through Month 9 of the construction period.

Table 2.1-3 provides an estimate of the average and peak construction traffic during the 12-month construction period.

TABLE 2.1-3
Average and Peak Construction Traffic

Vehicle Type	Average Daily Trips	Peak Daily Trips
Construction Workers	220	408
Delivery	5	8
Heavy Trucks	5	10
Total	**230**	**426**

Construction laydown and parking areas will be within existing site boundaries and on the SCE easement, north of the plant site. Construction access will be from Bixby Drive, as shown on Figure 2.1-1. Materials and equipment will be delivered by truck.

2.1.16 Generating Facility Operation

WCEP will be operated by two operators per shift, plus two relief operators and one maintenance technician, for a total staff of nine. The facility will be capable of being dispatched throughout the year, but is expected to operate primarily during the utility-defined on-peak and mid-peak periods.

WCEP is designed as a peaking facility to serve load during periods of high demand, which generally occur during daytime hours, and more frequently during the summer than other portions of the year. However, because the LMS100 CTGs are more efficient than any previous peaking generators, and more efficient that any of the aging gas-fired steam generation facilities in Southern California, WCEP will be economical to operate more than is typical for peaking generators, and will operate on the order of approximately a 20 to 40 percent annual capacity factor. The actual capacity factor in any month or year will depend on weather-related customer demand, load growth, hydroelectric supplies, generating unit retirements and replacements, the level of generating unit and transmission outages, and other factors. All of the electricity produced by the plant will be sold under contract or on a merchant basis to the power market. The exact operational profile of the plant will be dependent on weather conditions and the power purchaser's economic dispatch decisions.

Because the capacity will be sold through contract and the prices that will be offered for spot purchases are unknown at this time, the exact mode of operation cannot be described. It is conceivable, however, that the facility could be operated in one or all of the following modes:

- **Summer Design Load**. The facility would be operated at maximum continuous output for as many hours per year as dispatched by the power purchaser. As the facility is designed to be a peaking facility, it is expected to operate only during high ambient temperature periods and/or periods of peak demand.
- **Load Following**. The facility would be available at contractual load but operated at less than maximum available output at high load times of the day. The output of each unit would therefore be adjusted periodically, either by schedule or automatic generation control, to meet whatever load proved profitable to the power purchaser or necessary by CAISO.
- **Partial Shutdown**. Less than all five CTGs would be operating at full load or in load following mode, and the remaining units would be shut down. If the shutdown units are not undergoing maintenance, they will in most cases be available to the power purchaser and the CAISO as non-spinning reserve units. This mode of operation can be expected to occur during average- to low-load hours (off-peak hours, weekends, and shoulder months).
- **Full Shutdown**. This would occur if forced by equipment malfunction, fuel supply interruption, transmission line disconnect, or scheduled maintenance of equipment common to all units. Because WCEP is a peaker, full shutdown for economic reasons would be expected for a majority of the off-peak hours of the year, although non-spinning reserve capability would still be available.

In the unlikely event of a situation that causes a longer-term cessation of operations, security of the facilities will be maintained on a 24-hour basis, and the California Energy

Commission (CEC) will be notified. Depending on the length of shutdown, a contingency plan for the temporary cessation of operations may be implemented. Such contingency plan will be in conformance with all applicable LORS and protection of public health, safety, and the environment. The plan, depending on the expected duration of the shutdown, could include the draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment. All wastes will be disposed of according to applicable LORS. If the cessation of operations becomes permanent, the plant will be decommissioned (see Section 4.0, Facility Closure).

2.2 Facility Safety Design

WCEP will be designed to maximize safe operation. Potential hazards that could affect the facility include earthquake, flood, and fire. Facility operators will be trained in safe operation, maintenance, and emergency response procedures to minimize the risk of personal injury and damage to the plant**.**

2.2.1 Natural Hazards

The principal natural hazard associated with the WCEP site is earthquakes. The site is located in Seismic Risk Zone 4. Structures will be designed to meet the seismic requirements of CCR Title 24 and the latest edition of the California Building Code (CBC). (see Section 8.4, Geologic Hazards and Resources.) This section includes a review of potential geologic hazards, seismic ground motion, and potential for soil liquefaction due to ground-shaking. Potential seismic hazards would be mitigated by implementing the CBC construction guidelines. Appendix 10B, Structural Engineering, includes the structural seismic design criteria for the buildings and equipment.

Flooding is not a hazard of concern. According to the Federal Emergency Management Agency (FEMA), the site is not within either the 100- or 500-year flood plain, and otherwise is within an area of undetermined flood hazard status. Section 8.15, Water Resources, includes additional information on the potential for flooding.

2.2.2 Emergency Systems and Safety Precautions

This section discusses the fire protection systems, emergency medical services, and safety precautions to be used by project personnel. Section 8.10, Socioeconomics, includes additional information on area medical services, and Section 8.16, Worker Safety, includes additional information on safety for workers. Appendices 10A through 10G contain the design practices and codes applicable to safety design for the project. Compliance with these requirements will minimize project effects on public and employee safety.

2.2.2.1 Fire Protection Systems

The project will rely on both onsite fire protection systems and local fire protection services.

2.2.2.1.1 Onsite Fire Protection Systems

The fire protection systems are designed to protect personnel and limit property loss and plant downtime from fire or explosion. The project will have the following fire protection systems.

CO_2 Fire Protection System

This system protects the combustion turbine, generator, and accessory equipment compartments from fire. The system will have fire detection sensors in all compartments. Actuating one sensor will provide a high-temperature alarm on the combustion turbine control panel. Actuating a second sensor will trip the combustion turbine, turn off ventilation, close ventilation openings, and automatically release the CO_2. The CO_2 will be discharged at a design concentration adequate to extinguish the fire.

Transformer Protection

A concrete fire wall is planned for each step-up transformer to limit a potential transformer fire to its concrete basin area.

Fire Hydrants/Hose Stations

This system will supplement the plant fire protection system. Water will be supplied from the plant underground fire water/domestic water system. The project will include a diesel fire pump if the Los Angeles County Fire Department determines this to be necessary.

Fire Extinguisher

The plant Administrative/Maintenance Building, water treatment facility, and other structures will be equipped with portable fire extinguishers as required by the local fire department.

2.2.2.1.2 Local Fire Protection Services

In the event of a major fire, the plant personnel will be able to call upon the local Fire Department for assistance. The Hazardous Materials Risk Management Plan (see Section 8.5, Hazardous Materials Handling) for the plant will include all information necessary to permit all fire-fighting and other emergency response agencies to plan and implement safe responses to fires, spills, and other emergencies.

2.2.2.2 Personnel Safety Program

WCEP will operate in compliance with federal and state occupational safety and health program requirements. Compliance with these programs will minimize project effects on employee safety. These programs are described in Section 8.16, Worker Safety.

2.3 Facility Reliability

This section discusses the expected facility availability, equipment redundancy, fuel availability, water availability, and project quality control measures.

2.3.1 Facility Availability

Because of WCEP's predicted high efficiency relative to other units traditionally used for peaking service, it is anticipated that the facility will normally be called upon to operate at annual capacity factors of approximately 20 to 40 percent. The facility will be designed to operate between 50 and 100 percent of base load to support dispatch service and automatic generation control in response to customer demands for electricity.

WCEP will be designed for an operating life of 30 years. Reliability and availability projections are based on this operating life. Operation and maintenance procedures will be consistent with industry standard practices to maintain the useful life status of plant components.

The percent of time that the power plant is projected to be operated is defined as the "service factor." The service factor considers the amount of time that a unit is operating and generating power, whether at full or partial load. CAISO market data available to the public is not sufficient to predict a difference between capacity factor and service factor. The service factor, which considers the projected percent of time of operation, differs from the equivalent availability factor (EAF), which considers the projected percent of energy production capacity achievable.

The EAF may be defined as a weighted average of the percent of full energy production capacity achievable. The projected EAF for WCEP is estimated to be approximately 92 to 98 percent.

The EAF, which is a weighted average of the percent of energy production capacity achievable, differs from the "availability of a unit," which is the percent of time that a unit is available for operation, whether at full load, partial load, or standby.

2.3.2 Redundancy of Critical Components

The following sections identify equipment redundancy as it applies to project availability. A summary of equipment redundancy is shown in Table 2.3-1.

TABLE 2.3-1
Major Equipment Redundancy

Description	Number	Note
CTGs	Five trains	
Circulating water pumps	Two, 50 percent capacity	
Cooling tower	One, multi-cell tower	Cooling tower is multi-cell mechanical draft design
Demineralizer—RO Systems	Two, 60 percent trains	Rental ion exchange units, offsite regeneration.
Natural Gas Compressors	Three, 50 percent capacity	

2.3.2.1 Simple-cycle Power Block

Five separate combustion turbine power generation trains will operate in parallel within the simple-cycle power block. Each CTG will provide approximately 20 percent of the total power block output. The major components of the simple-cycle power block consist of the following subsystems.

2.3.2.1.1 Combustion Turbine Generator Subsystems

The combustion turbine subsystems include the combustion turbine, inlet air filtration and evaporative inlet cooling system, generator and excitation systems, and turbine control and instrumentation. The combustion turbine is comprised of a compressor section, a combustion section, and a turbine section. Air compressed in the compressor section of the combustion turbine is heated by the combustion of natural gas in the combustion section, and then allowed to expand in the turbine section, where the expansion turns the rotor to produce mechanical energy to drive the compressor and generator. Exhaust gas from the combustion turbine will be directed into an SCR to control NO_x emissions and an oxidation catalyst to control CO emissions. The generator will be air cooled. The generator excitation system will be a solid-state static system. Combustion turbine control and instrumentation (interfaced with the DCS) will cover the turbine governing system, and the protective system.

2.3.2.2 Distributed Control System

The DCS will be a redundant microprocessor-based system that will provide the following functions:

- Control the CTG, and other systems in response to unit load demands (coordinated control)
- Provide control room operator interface
- Monitor plant equipment and process parameters and provide this information to the plant operators in a meaningful format
- Provide visual and audible alarms for abnormal events based on field signals or software-generated signals from plant systems, processes, or equipment

The DCS will have functionally-distributed architecture comprising a group of similar redundant processing units linked to a group of operator consoles and an engineer workstation by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, annunciation, and historical purposes.

Plant operation will be controlled from the operator panel located in the control room. The operator panel will consist of two individual cathode ray tube (CRT)/keyboard consoles and one engineering workstation. Each CRT/keyboard console will be an independent electronic package so that failure of a single package does not disable more than one CRT/keyboard. The engineering workstation will allow the control system operator interface to be revised by authorized personnel.

2.3.2.3 Demineralized Water System

Makeup to the demineralized water system will be from the reclaimed water storage tank. The demineralized water system will consist of two 60 percent capacity makeup RO and mixed-bed demineralizer trains. Demineralized water will be stored in one 100,000-gallon demineralized water storage tank.

2.3.2.4 Water Injection Makeup and Storage

The water injection makeup and storage subsystem will provide demineralized water storage and pumping capabilities to supply high-purity water for water injection. Major components of the system are the demineralized water storage tank, providing approximately a four-hour supply of demineralized water at peak load and two full-capacity, horizontal, centrifugal, cycle makeup water pumps.

2.3.2.5 Circulating Water System

The circulating water system will provide cooling water to three closed-cooling water heat exchangers, rated at 33 percent capacity each. Three closed-cooling water heat exchangers will supply water to cool the combustion turbine intercooler and lube oil systems. There will be two 50-percent-capacity circulating water pumps supplying water to the closed cooling water heat exchangers.

2.3.2.6 Compressed Air

The compressed air system comprises the instrument air and service air subsystems. The service air system supplies compressed air to the instrument air dryers and to hose connections for general plant use. The service air system will include three 50 percent capacity air motor-driven compressors, service air headers, distribution piping, and hose connections. The instrument air system supplies dry compressed air at the required pressure and capacity for all control air demands, including pneumatic controls, transmitters, instruments, and valve operators. The instrument air system will include two 100 percent capacity air dryers with prefilters and after filters, an air receiver, instrument air headers, and distribution piping.

2.3.3 Fuel Availability

Fuel for the facility will be supplied by SoCalGas. The project will connect with an existing 30-inch natural gas pipeline owned by SoCalGas adjacent to the site. There is sufficient capacity in the transmission gas line to supply WCEP. See Section 6.0, Natural Gas Supply, for a more detailed description.

2.3.4 Water Availability

Reclaimed water for WCEP will be provided by the Rowland Water District. Potable water will also be supplied by the Rowland Water District. The availability of water to meet the needs of WCEP is discussed in more detail in Section 7.0, Water Supply.

2.3.5 Project Quality Control

The Quality Control Program that will be applied to WCEP is summarized in this section. The objective of the Quality Control Program is to ensure that all systems and components have the appropriate quality measures applied during all project phases, including design, procurement, fabrication, construction, or operation. The goal of the Quality Control Program is to achieve the desired levels of safety, reliability, availability, operability, constructability, and maintainability for the generation of electricity.

The required quality assurance for a system is obtained by applying controls to various activities, according to the activity being performed. For example, the appropriate controls for design work are checking and review, and the appropriate controls for manufacturing and construction are inspection and testing. Appropriate controls will be applied to each of the various activities for the project.

2.3.5.1 Project Stages

For quality assurance planning purposes, the project activities have been divided into the following eight stages that apply to specific periods of time during the project.

1. **Conceptual Design Criteria**—Define the requirements and engineering analyses.
2. **Detail Design**—Prepare calculations, drawings, and lists needed to describe, illustrate, or define systems, structures, or components.
3. **Procurement Specification Preparation**—Compile and document the contractual, technical and quality provisions for procurement specifications for plant systems, components, or services.
4. **Manufacturer's Control and Surveillance**—Ensure that the manufacturers conform to the provisions of the procurement specifications.
5. **Manufacturer Data Review**—Review manufacturers' drawings, data, instructions, procedures, plans, and other documents to ensure coordination of plant systems and components, and conformance to procurement specifications.
6. **Receipt Inspection**—Inspect and review of product at the time of delivery to the construction site.
7. **Construction/Installation**—Inspect and review of storage, installation, cleaning, and initial testing of systems or components at the facility.
8. **System/Component Testing**—Controlled operation of generating facility components in a system to ensure that the performance of systems and components conform to specified requirements.

The design, procurement, fabrication, erection, and checkout of each generating facility system will progress through the eight stages defined above.

2.3.5.2 Quality Control Records

The following quality control records will be maintained:

- Project instructions manual
- Design calculations
- Project design manual
- Quality assurance audit reports
- Conformance to construction records drawings
- Procurement specifications (contract issue and change orders)
- Purchase orders and change orders
- Project correspondence

For procured component purchase orders, a list of qualified suppliers and subcontractors will be developed. Before contracts are awarded, the subcontractors' capabilities will be evaluated. The evaluation will consider suppliers' and subcontractors' personnel, production capability, past performance, financial strength, and quality assurance program.

During construction, field activities are accomplished during the last four stages of the project: receipt inspection, construction/installation, system/component testing, and plant operations. The construction contractor will be contractually responsible for performing the work in accordance with the quality requirements specified by contract.

The subcontractors' quality compliance will be surveyed through inspections, audits, and administration of independent testing contracts.

A plant operation and maintenance program, typical of a project this size, will be implemented by WCEP to control operation and maintenance quality. A specific program for this project will be defined and implemented during initial plant startup.

2.4 Laws, Ordinances, Regulations, and Standards

The applicable LORS for each engineering discipline are included as part of Appendices 10A through 10G.

SECTION 7.0

Water Supply

This chapter describes the quantity and quality of water required, the primary and back-up water supply sources, water quality, and waste water discharges for the Walnut Creek Energy Park (WCEP).

7.1 Water Supply and Use

The Rowland Water District (District) will provide the industrial process water supply for the WCEP from the San Jose Creek Wastewater Reclamation Plant, via a 12-inch reclaimed water supply pipeline that is located in Bixby Drive adjacent to the project site. This pipe will supply tertiary treated reclaimed water **and impaired well water** to meet cooling and process makeup requirements. Cooling and process demands include water for cooling tower evaporation, drift, and blow down; combustion turbine-generator (CTG) air inlet cooling; CTG wash water; CTG water injection for control of oxides of nitrogen (NO_x) and increased power output. A "will-serve" letter from the District that describes the District's commitment of reclaimed water supply to the project and to accept sanitary waste water is included in Appendix 7A. One **nominal 180,000-** ~~150,000-~~gallon tank will be constructed onsite to store reclaimed water.

Water required for potable uses (sinks, toilets, showers, drinking fountains, eye wash/safety showers, plant hose stations, etc.) will be provided from Rowland Water District's water main in Bixby Drive.

The following water balances show the project's use of water:

- Base load operation under average ambient conditions (Figure 7.1-1)
- Peak load operation under summer ambient conditions (Figure 7.1-2)

Taking into account anticipated seasonal operation**,** ~~of~~ the WCEP will require approximately **1,450** ~~1,460~~ gallons per minute (gpm) of reclaimed water **as annual average** ~~for operation at under average ambient conditions (62ºF dry bulb temperature [DBT])~~. Under summer ambient conditions (**94°F** ~~92ºF~~ DBT), the WCEP will require approximately **1,984** ~~1,528~~ gpm of reclaimed water for operation at peak load. Peak load operation assumes all CTGs operating at 100 percent load. On an annual ~~average~~ basis, the WCEP is estimated to require~~, at 100 percent load,~~ approximately **885 ac-ft/yr** ~~6.75 acre-feet/day~~ of reclaimed water. WCEP potable water demands are estimated to average 3.0 gpm, less than 5 acre-feet per year.

Potable water for consumption and sanitary purposes will be provided through a ~~4-inch-diameter tap~~ **connection** to the water main in Bixby Drive adjacent to the project site.

7.2 Water Quality

Table 7.2-1 describes the quality of the reclaimed water that will be supplied to the project.

TABLE 7.2-1
Summary of Design Basis ~~Average~~ Water Quality Characteristics for Reclaimed Source Water

Water Quality Parameter	Reclaimed Water (cooling and process supply)[a]	Drinking Water Standard	Secondary Drinking Water Standard
General Parameters			
Alkalinity (as $CaCO_3$)	~~147~~ **195**	no standard (mg/l)	
Hardness (as $CaCO_3$)	~~192~~ **329**	200 mg/l	
Nitrate as NO_3	~~19~~ **17**	45 mg/l	
pH	6.9 **- 7.3**	6.0 – 9.0 units	6.5 – 8.5
Total Dissolved Solids	~~619~~ **722**	1,500 mg/l	500 mg/l
Total Solids	~~677~~ **727**		
Turbidity	<2 ntu	1-5 ntu	
Chemical Parameters			
Arsenic	~~<0.0009~~ **<0.0005**	0.05 mg/l[b]	
Boron[b]	~~0.47~~ **0.42**	no standard (mg/l)	
Cadmium	~~<0.0003~~ **<0.00045**	0.005 mg/l	
Calcium	~~48.6~~ **79.0**	no standard (mg/l)	
Chloride	~~147~~ **143**	500 mg/l	250 mg/l
Chromium (total)	<0.01	0.05 mg/l (0.1 mg/l)	
Copper (at tap)	~~<0.006~~ **<0.02**	TT[c] action level 1.3 mg/l	1 mg/l
Fluoride	~~0.33~~ **0.34**	2 mg/l	2 mg/l
Iron	~~0.093~~ **0.09**	0.30 mg/l	0.3 mg/l
Lead (at tap)	~~<0.001~~ **<0.0019**	TT[c] action level 0.015 mg/l	
Magnesium	~~17~~ **22.6**	no standard (mg/l)	
Manganese	~~0.027~~ **0.03**	no standard (mg/l)	0.05 mg/l
Mercury (inorganic)	~~<0.00003~~ **<0.0002**	0.002 mg/l	
Nickel	~~<0.018~~ **<0.017**	no standard (mg/l)	
Potassium	~~14.6~~ **11.9**	no standard (mg/l)	
Silver	~~<0.0002~~ **<0.0023**	no standard (mg/l)	0.01 mg/l
Sodium	~~134~~ **127**	350 mg/l	
Sulfate	~~127~~ **162**	500 mg/l	250 mg/l
Zinc	~~0.08~~ **0.07**	no standard (mg/l)	5 mg/l

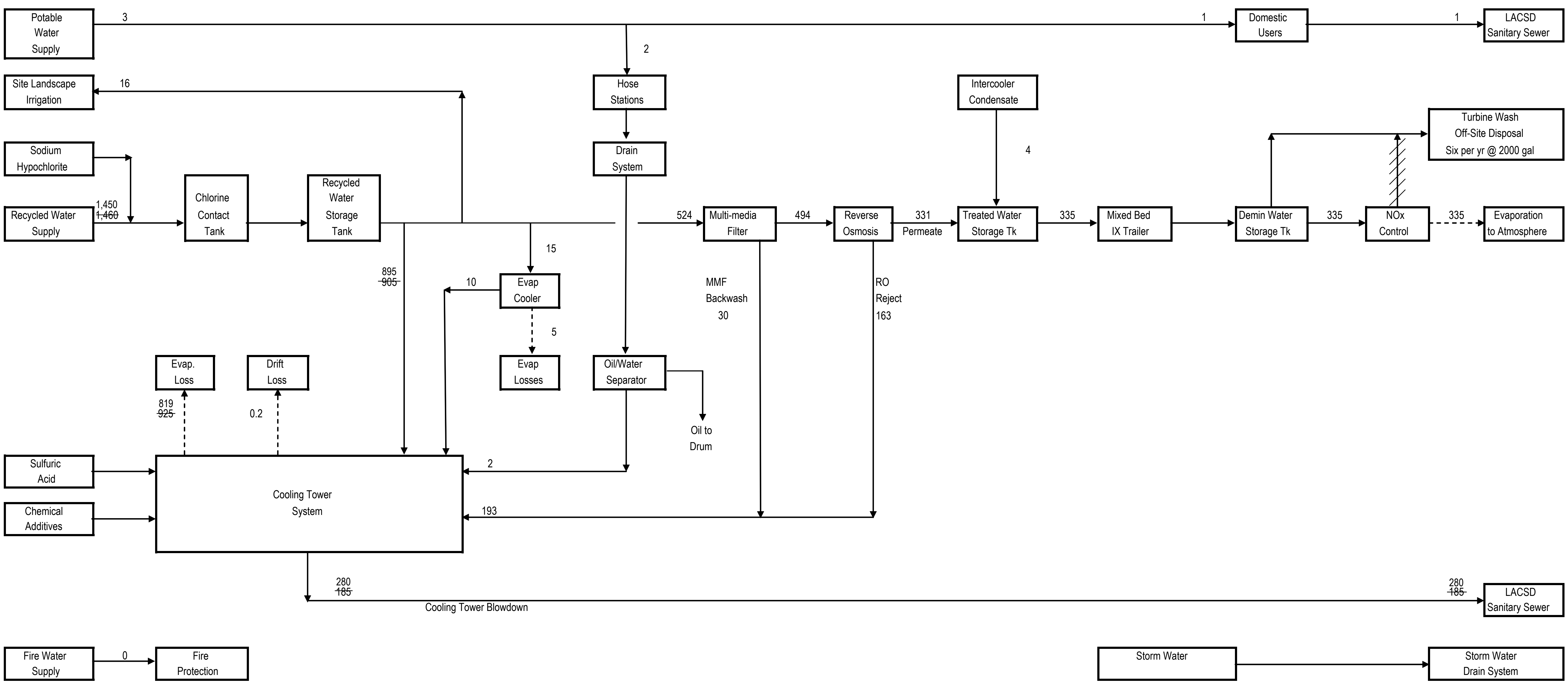
Source: U.S. Environmental Protection Agency. 2004. Drinking Water Standards and Health Advisories. Winter, 2004.

[a] Data are from Rowland Water District**, including** San Jose Creek Water Reclamation Plant **(84%) and Carrier Water Well (16%)**. Units are mg/l unless otherwise indicated.

[b] Arsenic standard will change to 0.01 mg/l as of 1/23/06. Boron standard is under review.

[c] TT = Treatment technique indicates that there is a required process to reduce the level of a contaminant in drinking water. The action level for copper is 1.3 mg/l. For lead it is 0.015 mg/l

[d] National Secondary Drinking Water Regulations (NSDWRs or secondary standards) are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as undesirable taste, odor, or color) in drinking water.



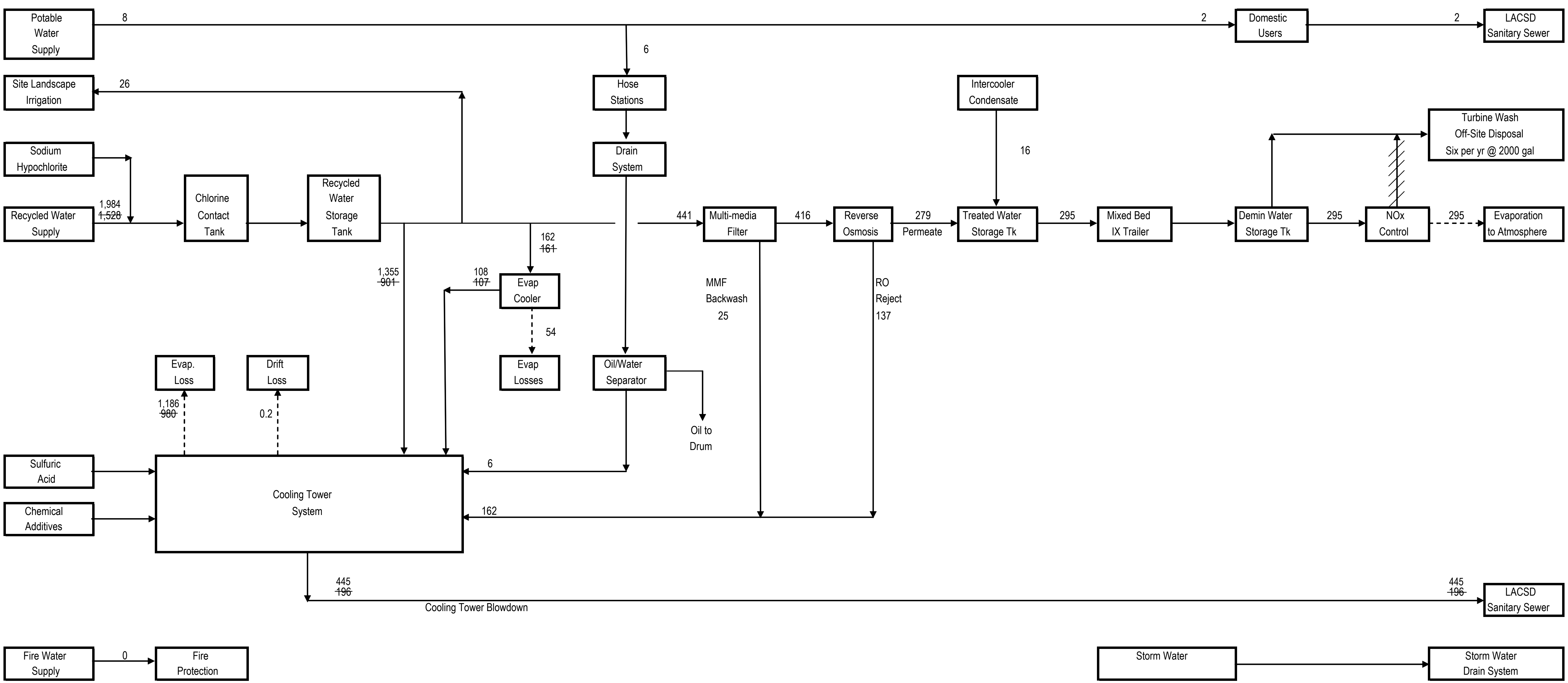
Notes:

1. Numerical values represent steady state flow in gpm
2. Cooling Tower Blowdown is estimated at normal maximum operating cycles of concentration (5.1 ~~6~~ X Recycle Water Supply concentration)
3. Recycled Water Supply includes the Carrier Water Well @ 22% of Total Flow

~~3. Ambient temperature assumed for this water balance is 62 F DBT/56 F WBT~~

FIGURE 7.1-1
PLANT WATER FLOW—ANNUAL AVERAGE FLOW
WALNUT CREEK ENERGY PARK
CITY OF INDUSTRY, CALIFORNIA

CH2MHILL



Notes:

1. Numerical values represent steady state flow in gpm
2. Cooling Tower Blowdown is estimated at normal maximum operating cycles of concentration (4.4 ~~6~~ X Recycle Water Supply concentration)
3. Ambient temperature assumed for this water balance is 94 ~~92~~ F DBT/75 ~~69.8~~ F WBT
4. Recycled Water Supply includes the Carrier Water Well @ 16% of Total Flow

FIGURE 7.1-2
PLANT WATER FLOW—
MAXIMUM DAILY FLOW
WALNUT CREEK ENERGY PARK
CITY OF INDUSTRY, CALIFORNIA

CH2MHILL

E092005017SAC_Walnut_Creek_AFC wc_figure_7_1_2.ai 08-23-06 tdaus

7.3 Water Treatment

Water treatment will be provided onsite prior to use for water injection. Demineralized water will be used for NO_x injection water. The demineralized water will be produced by a reverse osmosis (RO) and Ion Exchange (IX) system. The demineralized water will be stored in a 100,000-gallon demineralized water storage tank.

Makeup water will be pumped from the reclaimed water storage tank to the cooling tower basins as required to replace water lost from evaporation, drift, and blowdown. A chemical feed system will supply water conditioning chemicals to the circulating water to minimize corrosion and control the formation of mineral scale and biofouling. Sulfuric acid will be fed into the circulating water system in proportion to makeup water flow for alkalinity reduction to control the scaling tendency of the circulating water. The acid feed equipment will consist of a bulk sulfuric acid storage tank and two full-capacity sulfuric acid metering pumps.

To further inhibit scale formation, a polyacrylate solution will be fed into the circulating water system as a sequestering agent in an amount proportional to the circulating water blowdown flow. The scale inhibitor feed equipment will consist of a chemical solution bulk storage tank and two full-capacity scale inhibitor metering pumps.

To prevent biofouling in the circulating water system, sodium hypochlorite will be fed into the system. The hypochlorite feed equipment will consist of a bulk storage tank and two full-capacity hypochlorite metering pumps. A small storage tank, or 100- to 400-gallon totes, and two full-capacity metering pumps will be provided for the feeding of either stabilized bromine or sodium bromide as alternate biocides.

7.4 Wastewater ~~Waste Water~~ Collection, Treatment, and Disposal

Circulating (or cooling) water system blowdown will consist of reclaimed makeup water and other recovered process wastewater sources that have been concentrated by evaporative losses in the cooling tower, and residues of the chemicals added to the circulating water. These chemicals will control scaling and biological growth in the cooling tower and corrosion of the circulating water piping and condenser tubes. Cooling water treatment will require the addition of a pH control agent (acid), a mineral scale dispersant (that is, polyacrylate polymer), corrosion inhibitors (phosphate based), and biocide (that is, sodium hydroxide or equivalent). The estimated quality of the circulating water is listed in Table 7.4-1. **A portion of this concentrated water will then be removed from the cooling tower via the blowdown to prevent the mineral scale formation on heat transfer surfaces.** Operating at **5.1** ~~6~~ cycles of concentration times the reclaimed water makeup quality, the volume of blowdown is expected to be about **280** ~~185~~ gpm under annual average climatic conditions and about **445** ~~196~~ gpm under maximum daily climatic conditions, **operating at 4.4 cycles of concentration**. ~~A portion of this concentrated water will then be removed from the cooling tower via the blowdown to prevent the mineral scale formation on heat transfer surfaces.~~ **This** ~~The~~ non-reclaimable wastewater will be discharged to Section No. 3 of the Los Angeles County Sanitation District (LACSD) No. 21's 48-inch trunk sewer that runs in a utility easement within the WCEP project parcel, adjacent to and parallel with its southern boundary. The

TABLE 7.4-1
Estimated Recirculating Cooling Water Composition at Design ~~**Maximum**~~ Concentration

Water Quality Parameter	Cooling Water Composition at Design ~~Maximum~~ Concentration
General Parameters	
Alkalinity (as $CaCO_3$)	100
Hardness (as $CaCO_3$)	~~1,550.9~~ **1,447**
Nitrate as NO_3	~~153.5~~ **103**
pH	7.6
Total Dissolved Solids	~~5,000~~ **3,458**
Total Solids	~~5,050~~ **3,508**
Turbidity	<100 ntu
Chemical Parameters	
Arsenic	~~<0.00727~~ **<0.009**
Boron	~~3.80~~ **2.2**
Cadmium	~~<0.00242~~ **<0.002**
Calcium	~~392.6~~ **404**
Chloride	~~1,187.4~~ **664**
Chromium, T	~~<0.081~~ **<0.04**
Copper	~~<0.0485~~ **<0.06**
Fluoride	~~2.67~~ **2.0**
Iron	~~0.751~~ **0.43**
Lead	~~<0.0081~~ **<0.01**
Magnesium	~~137.3~~ **106**
Manganese	~~0.218~~ **0.14**
Mercury	~~<0.00024~~ **<0.00085**
Nickel	~~<0.145~~ **<0.08**
Potassium	~~117.93~~ **63**
Silver	~~<0.0016~~ **<0.0078**
Sodium	~~1,082.4~~ **566**
Sulfate	~~2075.8~~ **1,660**
Zinc	~~0.6462~~ **0.39**

* Assumes **4.4** ~~8.1~~ cycles of concentration ~~as a~~ **at design concentration at maximum daily flow conditions** ~~maximum-use scenario~~. Units are mg/L unless otherwise indicated.

Sanitation District is currently processing a permit to accept the waste discharge, but has provided preliminary oral communication that it could and would accept the quantity and quality of wastewater as described in this section.

7.4.1 Cooling Tower Drift

Because high efficiency drift eliminators will be used in the cooling towers, the amount of total dissolved solids (TDS) emitted to the atmosphere will be very low. The drift quality is equivalent to the blowdown quality. The drift volume is typically expressed as a percentage of the circulating water rate (in this case 0.0005 percent of <u>**34,000**</u> ~~35,500~~ gpm, or 0.2 gpm). At <u>**5.1**</u> ~~8~~ cycles of concentration, the TDS in the drift is expected to be approximately <u>**3,684**</u> ~~5,000~~ mg/L.

The TDS emitted from the cooling tower in the form of drift is treated as a particulate emission (PM_{10}). <u>**In order to conservatively estimate the cooling tower particulate emissions, the TDS was assumed to be 5,000 mg/L.**</u> At a drift rate of 0.2 gpm, this is equivalent to about 0.44 lb/hr of particulate emissions (see Section 8.1, Air Quality).

7.4.2 Sanitary Waste Water

Sanitary waste water from sinks, toilets, showers and other sanitary facilities will be discharged to Section 3 of LACSD No. 21's 48-inch trunk sewer that runs within the project parcel, via a 6-inch diameter pipeline. The sanitary waste water flow will average about <u>**1.0**</u> ~~2.0~~ gpm (<u>**1,440**</u> ~~2,880~~ gpd).

7.4.3 Plant Drainage

Miscellaneous general plant drainage will consist of cleanup, sample drainage, equipment leakage, and drainage from facility containment areas. Water from these areas will be collected in systems of floor drains, sumps, and pipes within the WCEP and discharged to an oil/water separator. The oil-free discharge water will be recycled to the cooling tower basin. An average flow of 2 gpm and a peak flow of 6 gpm are projected. The water will have essentially the same characteristics as the reclaimed water supplied to WCEP. The site plan in Appendix 7B shows plant drainage after construction and indicates how best management practices would be applied for storm water. Plant drainage and storm water discharge permitting is addressed further in Section 8.15, Water Resources. Appendix 7C contains a description of the water calculations used to determine the volume of storm water.

7.5 References

U.S. Environmental Protection Agency. 2004. *Drinking Water Standards and Health Advisories*. Winter.

8.15 Water Resources

This section provides a discussion of the existing water resources in the vicinity of the WCEP site and assesses the potential effects of project construction and operations on water resources. Specifically, this chapter discusses the WCEP and its potential effects in the following areas:

- Use of recycled water for cooling and process water
- Water supply and quality
- Disposal of waste water
- Compliance with state water policies
- Stormwater discharge
- Flooding

Section 8.15.1 discusses the existing hydrologic environment. Potential environmental effects of the WCEP construction and operation on water resources are assessed in Section 8.15.2. Section 8.15.3 discusses proposed mitigation measures that will prevent significant impacts. A discussion of cumulative project impacts is presented in Section 8.15.4. Section 8.15.5 presents applicable LORS related to water resources. Section 8.15.6 describes permits that relate to water resources, lists contacts with relevant regulatory agencies, and presents a schedule for obtaining permits. References cited are listed in Section 8.15.7.

8.15.1 Affected Environment

8.15.1.1 Water Features, Rainfall, and Drainage

The WCEP site is located in the City of Industry in Los Angeles County, approximately 12 miles east of the City of Los Angeles. Annual precipitation in Los Angeles County averages about 15 inches, and can vary significantly depending upon local conditions. Under the modified Köppen classification system, Los Angeles climate is categorized as Mediterranean, with dry summers and rainy winters with a relatively modest transition in temperature (National Oceanic and Atmospheric Administration, 2005).

The project is located within the San Gabriel River Watershed (SGRW). The San Gabriel River receives drainage from approximately 689 square miles. The main channel is approximately 58 miles long, and empties into the Pacific Ocean at the Los Angeles/ Orange County border. Approximately 75 percent of the SGRW is urbanized, with the remaining portion lying in the Angeles National Forest. The major surface water feature in the project vicinity is San Jose Creek, which is an unlined channel located adjacent to the project site. San Jose Creek drains into the San Gabriel River approximately 5 miles downstream of the WCEP site. The San Gabriel River and San Jose Creek both receive discharge water from wastewater treatment plants and stormwater systems within the surrounding areas (LARWQCB, 2000).

Beneficial uses, as defined by the Los Angeles Regional Water Quality Control Board's (LARWQCB) Water Quality Control Plan for the Los Angeles Region (Basin Plan) for the two waterways are listed in Table 8.15-1.

TABLE 8.15-1
Beneficial Uses of Project Area Water Ways

Waterways	MUN	IND	PROC	AGR	GWR	REC1	REC2	WARM	COLD	WILD	RARE
San Gabriel River (Main Stem)	E	E	E	E	E	E	E	E	E	E	E
San Jose Creek	P				I	Pm	I	I		E	

Definitions:

MUN Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.

IND Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization.

PROC Uses of water for industrial activities that depend primarily on water quality.

AGR Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

GWR Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance or water quality, or halting of saltwater intrusion into freshwater aquifers.

REC1 Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

REC2 Uses of water for recreational activities involving proximity to water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

WARM Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

COLD Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

WILD Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

RARE Uses of water that support habitats necessary, at the least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.

E = Existing beneficial use
P = Potential beneficial use
I = Intermittent beneficial use
m = Access prohibited by Los Angeles County Department of Public Works (DPW) in concrete-channelized areas.

Source: LARWQCB, 1994

8.15.1.2 Groundwater

Groundwater underlying the project area is part of the 177,000-acre Central Subbasin of the Los Angeles Coastal Plain groundwater basin, commonly called the Central Basin (Figure 8.15-1). The Central Basin is bounded on the north by a surface divide called the La Brea high; on the northeast and east by Tertiary rocks of the Elysian, Repetto, Merced, and Puente Hills; on the southeast by Coyote Creek and the Newport Inglewood fault system; and on the southwest by the Newport Inglewood uplift.

Groundwater occurs in Holocene and Pleistocene sediments at relatively shallow depths. The Montebello forebay extends southward from the Whittier Narrows where the San Gabriel River encounters the Central Basin and is the most important area of recharge in the subbasin (California Department of Water Resources [DWR], 2004). The main productive freshwater-bearing sediments are contained within Holocene alluvium and the Pleistocene Lakewood and San Pedro Formations (DWR, 1961 as cited by DWR, 2004).

Pumping has lowered the water level in the Central Basin. Groundwater enters the subbasin through surface and subsurface flow and by direct percolation of precipitation, stream flow (from the Whittier Narrows and San Gabriel River), and applied water. Historical basin water levels varied over a range from 5 to 25 feet; however, recent measurements have shown basin water levels in the upper portion of their historical range (approximately 5 to 10 feet). Urban extractions for the subbasin were 204,335 acre-feet in 1998 (DWR 1999, as cited by DWR, 2004).

8.15.1.3 Flooding Potential

The entire City of Industry, including the project site, is currently classified as flood class "D" by the Federal Emergency Management Agency (FEMA, 2005) (Figure 8.15-2). Zone "D" is considered a moderate, minimal hazard area. This zoning designation is given to areas where the flood hazard is undetermined, and usually for sparsely populated areas (FEMA, 2005a).

8.15.2 Environmental Consequences

Project effects on water resources can be evaluated relative to significance criteria derived from the CEQA Appendix G checklist. Under CEQA, the project is considered to have a potentially significant effect on water resources if it would:

- Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which will result in substantial erosion or siltation on- or offsite, or in flooding on- or offsite.
- Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff.
- Violate any water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there will be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells will drop to a level which will not support existing land uses or planned uses for which permits have been granted).
- Place within a 100-year flood hazard area structures that will impede or redirect flood flows.
- Cause inundation by seiche, tsunami, or mudflow.

8.15.2.1 Water Supply

This section characterizes the sources and quality of water needed for power generation and other operations at WCEP. Average and maximum daily and annual water demand are provided in Table 8.15-2.

8.15.2.1.1 Process Water

The Rowland Water District **(RWD)** will provide the industrial process water supply for the WCEP via a 12-inch reclaimed water supply pipeline located in Bixby Drive adjacent to the project site. The source of the reclaimed water is the San Jose Creek Wastewater Reclamation Plant, operated by the County Sanitation Districts of Los Angeles (LACSD) **supplemented by impaired well water supplied by two existing ground wells. These two impaired ground wells contain high TDS (1000 to 1200) and are currently the primary source of Rowland Water District reclaim water supply. One well, know as the Carrier Well, pumps 300 gpm of water continuously into the RWD reclaim water system with any excess water discharged to the San Jose Creek discharge channel. The second well, RWD well No. 1, pumps from the same aquifer as the Carrier Well and delivers to the reclaim water system as needed.**

The reclaimed water supply will be treated with a 90 minute contact time using sodium hypochlorite solution and pumped to a recycled water storage tank. This disinfection process will ensure that the reclaimed water meets the Title 22 criteria for recycled water.

TABLE 8.15-2
Daily and Annual Water Usage Estimates for WCEP Operations

Water Use	Water Source	Daily Use (gpm[a]) Average	Daily Use (gpm[a]) Maximum	Annual Use (ac-ft/yr[b]) Average [c]
Process water (reclaimed)	Rowland Water District	~~1,460~~ **1,450**	~~1,528~~ **1,984**	~~771~~ **885**
Potable water	Rowland Water District	3	8	1.2

[a] gpm = gallons per minute

[b] ac-ft/yr = acre-feet per year

[c] Average Annual Use is **based on anticipated operations over a full annual cycle** ~~equal to the average daily water use [averaged over all days in a year on which the plant is operating] multiplied by the number of hours the plant would operate per year under the base case operating scenario~~. See Chapter 2 for a full description of the operating parameters.

The **chlorinated raw** ~~Title 22 recycled~~ water will then be divided into supply for the cooling towers and supply for NO_x suppression injection and compressor evaporative cooling. Cooling water treatment may require the addition of chemicals such as a pH control agent (acid or caustic), a mineral scale dispersant (i.e., polyacrylate polymer), a corrosion inhibitor (phosphate based), and a biocide (hypochlorite or equivalent). The water to be used for NO_x suppression injection and compressor evaporative cooling will be further treated, beginning with a reverse osmosis system followed by an **ion exchange** ~~electrodeionization~~ system.

8.15.2.1.2 Alternative Cooling Water Sources

The California State Water Resources Control Board (SWRCB) Policy 75-58 specifies that to protect water quality and quantity, water rights applications for cooling water for power plants can only be approved if other sources of water are not feasible. This resolution applies to the use of inland surface waters for cooling purposes. Since the project proposes to use recycled water for cooling water and is not applying for new water rights, Policy 75-58 is not applicable to this project.

8.15.2.1.3 Potable Water Use

Potable water is supplied to the City of Industry by the following sources: San Gabriel Valley Water, Suburban Water Systems, Rowland Water District, La Puente Valley Water District, City of Industry Water Works, and Walnut Valley Water District. Potable water for the WCEP will be served by the Rowland Water District via a 12-inch water main located in Bixby Drive adjacent to the project site. The WCEP will use potable water for domestic uses. Projected demand for potable water uses at the WCEP is approximately 4,320 gallons per day. Current and projected water supplies are adequate to meet this *de minimus* demand increase. Fire water will be supplied by the Rowland Water District through their 10-inch-diameter dedicated fire water system, connection with which is available on site.

During construction of the project, water will be required primarily for dust suppression. Because of the short duration of construction activities and the relatively limited water requirements (less than 200 gpm for 1 hour for dust control and soil compaction, at peak use) of the construction phase of the project, no significant adverse impacts to water supply are expected to result. Potential water supply impacts due to construction will be limited to surface water runoff during excavation and construction of these elements of the infrastructure. Such construction impacts are small and can be controlled through implementing a Storm Water Pollution Prevention Plan and associated best management practices and proper housekeeping at the construction site. Estimates of usage rates are provided as follows:

- Average daily: 50 gpm x 4 hours = 12,000 gallons per day (gpd) (based on size of site)
- Maximum Daily: 200 gpm x 10 hrs = 0.12 mgd (conservatively high estimate)
- Average annual: 180 days x 12,000 gpd = 2.16 mgy
- Maximum annual: Same as above

8.15.2.2 Wastewater Discharges and Disposal

This section characterizes the volume and quality of wastewater that would be generated by the WCEP and method of disposal. Estimated daily and annual wastewater discharge rates are provided in Table 8.15-3 for both maximum and daily operations

TABLE 8.15-3
Operational Wastewater Discharges from WCEP

Waste Discharge Stream	Discharge Location	Daily Discharge (gpm[a])		Annual Discharge (MG/yr[b])
		Average	Maximum	Average [c]
Cooling tower blowdown ~~Plant wastewater sump (discharge from process and cooling water, backwash water from ultra filters, and reject from reverse osmosis unit)~~	LACSD sanitary sewer system	~~185~~ **280**	~~196~~ **445**	~~34.0~~ **54.9**
Domestic wastewater	LACSD sanitary sewer system	1	2	~~0.01~~ **0.2**

TABLE 8.15-3
Operational Wastewater Discharges from WCEP

Waste Discharge Stream	Discharge Location	Daily Discharge (gpm[a])		Annual Discharge (MG/yr[b])
		Average	Maximum	Average [c]

[a] gpm = gallons per minute

[b] MG/yr = million gallons per year

[c] Average Annual **Discharge is based on anticipated operations over a full annual cycle** ~~Use is equal to the average daily water use [averaged over all days in a year on which the plant is operating] multiplied by the number of hours the plant would operate per year under the base case operating scenario~~. See Chapter 2 for a full description of the operating parameters.

8.15.2.2.1 Cooling Tower Blowdown

Circulating (or cooling) water system blowdown will consist of recycled water that has been concentrated **to** ~~at~~ approximately ~~6~~ **5.1** cycles of concentration **on an annual average basis** ~~and~~ **plus** residues of the chemicals added to the circulating water. These chemicals will control scaling and biofouling of the cooling tower and corrosion of the circulating water piping and condenser tubes. Cooling water treatment will require the addition of a pH control agent (acid), a mineral scale dispersant (i.e., polyacrylate polymer), corrosion inhibitors (phosphate based), and biocide (i.e., sodium ~~hydroxide~~ **hypochlorite** or equivalent).

Cooling tower blowdown will be discharged to the plant's wastewater sump as required to maintain the level of dissolved solids in the cooling water within acceptable ranges. Backwash water from **multi-media** ~~ultra~~ filters, reject water from the reverse osmosis unit, and wash water will ~~also~~ be **returned to the cooling tower for additional recovery** ~~discharged to the wastewater sump~~. ~~This~~ **The** wastewater would then be discharged to the City of Industry sanitary sewer facilities, which tie into the LACSD facilities via a regional trunk sewer line.

Table 8.15-4 summarizes the estimated water quality of wastewater discharges from the wastewater sump to the sanitary sewer system, based on **the average annual basis** of approximately **5.1** ~~6~~ cycles of concentration of the cooling tower blowdown. The constituents listed below were selected based on the LACSD's Wastewater Ordinance.

Quality and quantity of industrial wastewater discharges to the LACSD's sanitary sewer system must be in compliance with an Industrial Wastewater Discharge Permit to be issued by LACSD. As shown in Table 8.15-4, the anticipated quality of wastewater discharges from WCEP would be well within the LACSD's discharge limitations. Meeting these industrial discharge limitations indicates that water quality downstream of the San Jose Creek Water Reclamation Plant **(SJCWRP)** will be protected. The volume of domestic sewage would be about 1,440 gallons per day, which is negligible compared to the overall volume of discharges to the LACSD's sewer system. Therefore, impacts to the wastewater system, including the ultimate water quality objectives for treated wastewater, would be less than significant.

TABLE 8.15-4
Comparison of WCEP Non-Reclaimable Waste Water and LACSD Discharge Standards

Constituent	Wastewater (mg/L)	LACSD Allowable Concentrations (mg/L)
TICH[a]	<0.009	-
pH (Ph units)	6.9 **– 7.3**	>6.0
Total Suspended Solids	~~<1~~ **<50**	-
Total Dissolved Solids	~~619~~ **3,684**	-
Temperature (°F)	79	114
Arsenic	~~<0.0009~~ **<0.0026**	3
Cadmium (µg/L)[b]	~~<0.3~~ **<2.3**	15
Chromium	~~<0.01~~ **<0.05**	10
Copper	~~<0.006~~ **<0.08**	15
Lead	~~<0.001~~ **<0.0095**	40
Mercury (µg/L)[b]	~~<0.03~~ **<1.2**	2
Nickel	~~<0.018~~ **<0.08**	12
Silver (µg/L)[b]	~~<0.2~~ **<11.8**	5
Zinc	~~0.077~~ **0.38**	25

[a] TICH = Total Identifiable Chlorinated Hydrocarbons, which include such pesticides as aldrin, dieldrin, chlordane, DDT, endrin, hexachlorocyclohexane, toxaphene, and PCBs.

[b] µg/L = micrograms per liter.

Source: LACSD, 2005a.

8.15.2.2.2 Domestic Wastewater Disposal

Domestic wastewater generated at the WCEP, estimated at 1-gpm average and 2-gpm maximum, will also be discharged to the LACSD sanitary sewer system. This volume would be considered a *de minimus* increase in demand on the sewer system, not measurable within the overall dry weather flow and well within the treatment, conveyance, and disposal capacities of LACSD's system.

8.15.2.3 Stormwater Runoff and Drainage

The existing site is paved, and site drainage currently flows to a drain located in the facility parking lot. The drain empties into the storm drainage system, which eventually drains to the San Jose Creek (under jurisdiction of the U.S. Army Corps of Engineers) located north of the project site. Drainage on the site will include two discharge points, one to the northeastern corner and one to the south of the property boundaries. Stormwater management practices will follow the California Storm Water Quality Association (CASQA) California Storm Water BMP Handbook, Sections TC-20 and TC-22. Anticipated storm runoff is estimated at approximately 28 cfs per 60 minutes under a 25 year storm event. Connection to the storm drainage system is regulated by the Los Angeles County DPW. Appendix 7B contains drawings that show topography before and after construction and a drainage plan. Appendix 7C contains stormwater calculations.

At completion of the WCEP, on-site drainage will be accomplished through gravity flow. The surface grading will direct stormwater runoff to the stormwater drains via overland flow at a minimum slope of 0.5 percent. The main plant complex area will be graded with moderate slopes (1 percent minimum preferred) for effective drainage.

Miscellaneous general plant drainage will consist of sample drainage, equipment leakage, and drainage from facility containment areas. Water from these areas will be collected in systems of floor drains, sumps, and pipes within the WCEP and discharged to an oil-water separator. The separator will be an underground or aboveground vault with baffles to collect oils and solids. Wastewater will be routed through the baffles, allowing oils to rise to the surface and solids to settle to the bottom. The vault will be pumped out periodically. Oils will be removed using oil-absorbent pillows or other acceptable methods and transported to an approved disposal facility. After passing through the oil-water separator, oil-free waste water will be recycled to the cooling tower basin.

Stormwater falling outside of hazardous material containment areas (e.g., on plant roads and other paved or gravel surfaced areas and landscaped areas) will be collected by the existing system of catch basins for discharge to the San Jose Creek flood control channel.

Hazardous material containment areas (those areas with walls or dams built to contain spillage) will use an independent collection and treatment system. This system is separate from the stormwater collection and treatment system described in the prior paragraph.

8.15.2.4 Construction Effects on Water Quality

The site grading and drainage will be designed to comply with all applicable LORS The general site grading will establish a working surface for construction and plant operating areas, and will provide positive drainage from buildings and structures, and adequate ground coverage for subsurface utilities.

During construction, approximately 15 acres of land associated with the plant site and other facilities will be disturbed (including construction laydown and worker parking areas). Surface water impacts are anticipated to be related primarily to short-term construction activity and consist of increased turbidity due to erosion of newly excavated or placed soils. Activities such as grading can potentially destroy habitat and increase rates of erosion during construction. In addition, construction materials could contaminate runoff or groundwater if not properly stored and used. Compliance with engineering and construction specifications, following approved grading and drainage plans, and adhering to proper material handling procedures will ensure effective mitigation of these short-term impacts. BMPs for erosion control will be implemented. Additionally, erosion and sediment controls, surface water pollution prevention measures, and other BMPs will be developed and implemented for both construction and operational phases. These plans will be prepared in accordance with the NPDES construction permit issues by the SWRCB and local agency requirements.

To qualify for the NPDES statewide General Permit for Storm Water Discharges Associated with Construction Activity (General Construction Permit), WCEP will be required to develop a Storm Water Pollution Prevention Plan (SWPPP) prior to construction, to prevent the off-site migration of sediment and other pollutants and to reduce the effects of runoff from the construction site to offsite areas. Successful implementation of the SWPPP will ensure that construction impacts to water resources are mitigated to a less-than-significant level.

Very little hydrostatic test water will be needed for the natural gas connecting line because it extends only for a few feet. It will be chemically analyzed for contaminants and discharged into a dewatering structure consisting of hay bales, geotextile fabric, and silt fencing. The discharged water will filter through the hay bales and silt fence before it is discharged. These measures will be 90 percent or more effective in removing any sediments and other solids that may accumulate in the test water before discharge. The water will be discharged into the LACSD sanitary sewer system under the appropriate permit. None of the project discharges will thus affect waters of the state and a report of waste discharge is not required. Approximately 20,000 gallons of potable water will be used for hydrotesting power plant piping.

The construction phase of WCEP will require no groundwater removal. Stormwater is expected to result in only several days of dewatering during construction, and this will be done in accordance with best management practices. With an unusual storm year, this number could be as many as 5 to 10 days. Under a worst-case storm scenario where all of the stormwater would be collected in excavations, the water collected from a 10-year, 24-hour storm could be pumped out over 24-hours at a 50-gpm rate. For the WCEP project, this potential for site dewatering will only occur over a single rain season. Therefore, the maximum daily dewatering discharge would be 72,000 gallons and, for the sake of providing a quantity, an extreme worst-case annual maximum of 0.72 million gallons, based on the worst-case daily amount for 10 days in a year.

Water used for dust control and soil compaction during construction will not result in discharge. During the construction period, sanitary waste will be collected in portable toilets (no discharge) supplied by a licensed contractor for collection and disposal of sanitary wastes at an appropriate receiving facility. Equipment wash water will be collected and disposed of offsite.

8.15.2.5 Groundwater

Subsurface testing at the project site has shown that groundwater levels are approximately 20 to 30 feet below surface. The WCEP would make no direct use of groundwater resources and would have no effect on groundwater quantity or quality

8.15.3 Cumulative Impacts

The WCEP will not cause or contribute to cumulative impacts on water resources. Good engineering practices and BMPs will be used in the project design and operation. Stormwater discharge will adhere to a SWPPP and local agency water quality standards. No significant impacts to surface water or groundwater quality are expected during construction or operation of the project. The project will contribute to water conservation by making use of reclaimed water for power plant cooling, with high cycles of concentration.

8.15.4 Proposed Mitigation Measures

This section presents mitigation measures proposed to reduce impacts to water resources in areas affected by the project.

- Implement BMPs designed to minimize soil erosion and sediment transport during construction of the plant site and project corridor features. Design appropriate erosion and sediment controls for slopes, catch basins, culverts, stream channels, and other areas prone to erosion.

- Conduct operations at the plant site in accordance with the USEPA's Storm Water Phase I Final Rule (for construction activities disturbing 1 acre or more). Design and implement the BMPs to prevent or control pollutants potentially associated with the operation of the plant from entering stormwater sewers.
- Perform refueling and maintenance of mobile construction equipment only in designated lined and/or bermed areas located away from stream channels. Prepare and implement spill contingency plans in areas where they are appropriate.
- During construction of pipelines implement BMPs to control soil erosion.
- Prepare and submit a Title 22 Engineer's Report to the California DHS and LARWQCB to ensure safe use of recycled water for the cooling water. Adhere to Reclamation Requirements issued by the LARWQCB.
- Prepare and submit an SWPPP to ensure quality of discharged stormwater. Obtain concurrence with the LARWQCB for the SWPPP.

The mitigation measures proposed are prescribed by stormwater and erosion control management programs mandated under the NPDES permitting system. These programs have been in place for a number of years and the prescribed measures have proven effective. Under the General NPDES Permit for Construction, for example, various specific measures are prescribed, and a program of monitoring is required. The programs are at least 90 percent effective, have been in place for a number of years, as mandated by the CWA, and have proven effective.

8.15.5 Applicable Laws, Ordinances, Regulations, and Standards

Federal, state, and local LORS applicable to water resources aspects of the WCEP are discussed in this section and summarized in Table 8.15-5.

TABLE 8.15-5
Laws, Ordinances, Regulations, and Standards Applicable to WCEP Water Resources

LORS	Applicability	How Conformance Is Achieved
Federal		
CWA/Water Pollution Control Act. P.L. 92-500, 1972; amended by Water Quality Act of 1987, P.L. 100-4 (33 USC 466 et seq.); NPDES (CWA, Section 402); Toxic and Pretreatment Effluent Standards (CWA, Section 307)	Prohibits discharge of pollutants to receiving waters unless the discharge is in compliance with an NPDES permit. Applies to all wastewater discharges, including industrial wastewater, stormwater runoff and dewatering, during both construction and operation. Sets forth pretreatment requirements for the industrial discharges into publicly-owned treatment works.	Compliance with state implementation requirements as indicated by the LARWQCB (see below under State).
State		

TABLE 8.15-5
Laws, Ordinances, Regulations, and Standards Applicable to WCEP Water Resources

LORS	Applicability	How Conformance Is Achieved
Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code, Sections 13000-14050), including Basin Plan	Implements and enforces the federal NPDES permit program through conformance with beneficial uses and water quality objectives in the Basin Plan as well as conformance with any applicable Total Maximum Daily Load requirements and industrial pretreatment requirements.	Operational discharges of industrial and sanitary wastewater streams are conveyed to the LACSD's sewer system for treatment and disposal; discharges are regulated under an existing NPDES permit. Stormwater runoff is conveyed through the City of Industry and LACSD's stormwater sewer system into San Jose Creek; discharges are regulated under an existing NPDES permit for municipal stormwater.
California Water Code §13550 et seq. and State Water Resources Control Board Resolution 75-58	Encourages the conservation of water resources and the maximum reuse of wastewater, particularly in areas where water is in short supply.	California Water Code §13550 et seq. provides that use of potable water for specified uses is a prohibited waste of water resources when recycled water is currently available, as defined in that section. The WCEP proposes to use recycled water for process and cooling water and is, therefore, in conformance with these code sections. Res. No. 75-58 applies only to use of inland surface waters for cooling; but because the WCEP would use recycled water for cooling, this does not apply to this project.
Title 22 of the CCR (Division 4, Chapter 15)	Sets forth requirements for treatment and quality of recycled water for cooling.	Recycled water will be treated with a 90-minute contact time using sodium hypochlorite solution, in conformance with Title 22 requirements.
Local		
Los Angeles County Sanitation District, Wastewater Ordinance, Section 401	Regulates all discharges to the County's sewer system, including industrial wastewater.	The Applicant will comply with Section 401 for all discharges to the sewer system and will obtain a Permit for Industrial Wastewater Discharge. The Applicant will comply with all permit conditions, including the following: discharge limitations, pretreatment requirements, peak flow restrictions, dewatering discharges, payment of fees, and monitoring and reporting requirements.

8.15.5.1 Federal Laws, Ordinances, Regulations, and Standards

Federal Clean Water Act. The federal CWA and subsequent amendments, under the enforcement authority of the USEPA, was established "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA established the NPDES program to protect water quality of receiving waters. Under the CWA, Section 402, discharge of pollutants to receiving waters is prohibited unless the discharge is in compliance with an NPDES permit. In California, the USEPA has determined that the SWRCB and its nine RWQCBs have sufficient authority under state law to administer and enforce the federal NPDES permitting program. Surface and ground water in the project vicinity are under the jurisdiction of the LARWQCB. Discharges of wastewater from WCEP would flow to the LACSD's San Jose Creek WRP, which operates under an NPDES permit issued by the LARWQCB. Stormwater from WCEP would flow to the City of Industry's and/or LACSD's storm collection system. Stormwater flows primarily into San Jose Creek Municipal storm drainage is regulated under an existing NPDES permit.

In addition, Section 307 of the CWA requires pretreatment of industrial discharges into publicly-owned treatment works. Industrial discharges from the WCEP would be subject to these requirements, as implemented and enforced by the LACSD, Wastewater Ordinance, Part IV – Industrial Wastewaters. Because the industrial pretreatment standards would be enforced by the County Sanitation District, they are discussed below under local regulations.

8.15.5.2 State

Porter-Cologne Water Quality Control Act and the Basin Plan. The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) governs the regulation of water quality within California and establishes the authority of the SWRCB and the nine Regional Boards. The LARWQCB established regulatory standards and objectives for water quality in the Bay in the Basin Plan (LARWQCB, 1994). The Basin Plan identifies existing and potential beneficial uses and provides numerical and narrative water quality objectives designed to protect those uses.

Clean Water Act, Section 303d, Impaired Water Bodies. In accordance with Section 303(d) of the CWA, each state must present the USEPA with a list of impaired water bodies. The City of Industry is located within the San Gabriel River Watershed. The SWRCB has listed San Jose Creek and the San Gabriel River as *impaired water bodies* for certain specified contaminants. Impaired waters are defined as those that do not meet water quality standards, even after point sources of pollution have implemented pollution control technology. The law requires the development of action plans, known as Total Maximum Daily Loads (TMDL), to improve water quality of impaired water bodies. The TMDL is a calculation of the total amount of a pollutant that a water body can receive and still meet water quality objectives for a pollutant identified as causing impairment. The TMDL report allocates permissible quantities for discharge from specific sources. The pollutants that have been identified as causing impairment in San Jose Creek include algae and high chloroform count In the San Gabriel River, pollutants identified as causing impairment include algae, high chloroform county, toxicity, copper (dissolved), lead, and zinc (dissolved).

Industrial Stormwater NPDES Permit. The SWRCB implements regulations under the federal CWA requiring that point source discharges (a point source discharge of stormwater is a flow of rainfall runoff in some kind of discrete conveyance such as a pipe, ditch, channel, or swale) of stormwater associated with industrial activity that discharge either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit (SWRCB, 1997). The SWRCB has issued Waste Discharge Requirements for discharges of stormwater associated with industrial activities, such as the proposed project, and excluding construction activities. After the completion of construction, the proposed site would be graded to direct stormwater runoff to the stormwater sewer system.

Construction Stormwater NPDES Permit. The federal CWA effectively prohibits discharges of stormwater from construction sites unless the discharge is in compliance with an NPDES permit. The SWRCB is the permitting authority in California and has adopted a General Construction Permit (SWRCB, 1999a) that applies to projects resulting in one or more acres of soil disturbance. The proposed project would result in disturbance of more than one acre of soil. Therefore, the project will require the preparation of a Storm Water Pollution

Prevention Plan that would specify site management activities to be implemented during site development. These management activities will include construction stormwater BMPs, dewatering runoff controls, and construction equipment decontamination. Stormwater pollution prevention measures during construction will include but not be limited to those established by the *Stormwater Best Management Practice Handbook for Construction* (CASQA, 2003). Dewatering controls will include but may not be limited to containing dewatered water in a baker tank and installing erosion control measures to contain sediment from accidental spills or releases of dewatered water. Construction equipment will be cleaned by dry or wet methods as needed to prevent tracking soils offsite.

California Water Code Sections 13550, 13551, 461, and SWRCB Resolution No. 75-58. These water code sections and policy statements encourage the conservation of water resources and the maximum reuse of wastewater, particularly in areas where water is in short supply. California Water Code 13550, et seq., provides that use of potable water for specified uses is a prohibited waste of water resources when recycled water is available. The WCEP proposes to use recycled water for process and cooling water. SWRCB 75-58 sets forth the state's water quality control policy on the use and disposal of inland waters used for power plant cooling; this resolution applies only to uses of inland surface waters for cooling water. The WCEP proposes to use recycled water, not inland surface waters. Therefore, this resolution does not apply to the WCEP.

Title 22 Code of Regulations, Sections 60313 to 60316. The California DHS established water quality standards and treatment criteria for water recycling under Title 22, Chapter 4 of the CCR. Title 22 also specifies the reliability and redundancy for each recycled water treatment and use operation. For recycled wastewater piping, DHS has requirements for preventing backflow of recycled water into the potable water supply system and for avoiding cross-connection between recycled and potable water supply systems.

There will be no cross-connections of the WCEP recycled water and potable water systems. The WCEP will also provide sufficient equipment labels, signs, and notice for those pipelines carrying recycled water.

Walnut Creek Energy, LLC will prepare an Engineer's report in accordance with Title 22, Section 60323, which will include the following information:

- A detailed description of the intended use of the recycled water.
- Plans and specifications of the recycled water system.
- Methods to be used to ensure that the installation and operation of the dual-plumbed system will not result in cross-connections between the recycled water piping system and the potable water piping system. All recycled wastewater lines and valve boxes will be clearly identified to distinguish between recycled wastewater and potable water system.

8.15.5.3 Local Laws, Ordinances, Regulations, and Standards

County of Los Angeles, Wastewater Ordinance. The CWA requires that publicly-owned treatment works regulate the discharge of industrial wastes into a sewer system subject to an NPDES permit. Accordingly, the County of Los Angeles has adopted detailed permit requirements for industrial dischargers. The discharge of any wastewater to the County's sewer system would be subject to the requirements of the County's Wastewater Ordinance, which regulates the quantity and quality of discharges to the sewer system. Section 406 of the Wastewater Ordinance provides additional industrial waste discharge limits.

In accordance with the Wastewater Ordinance, the WCEP would be required to obtain an Industrial Wastewater Discharge Permit (IWDP) from the LA County Sanitation District. The IWDP would specify the detailed project-specific requirements applicable to the WCEP, including pretreatment standards, flow restrictions, and sampling, monitoring, and reporting requirements. The permit would be issued for a fixed time period, not to exceed 5 years, for Significant Industrial Users. As a condition of approval for an Industrial Waste Discharge Permit, the company may be required to participate in the District's Self Monitoring Program (SMP). The SMP would require the company to furnish chemical analysis of its industrial discharge on a regular basis. The type and frequency of the testing is determined on a case-by-case basis, and are included in the permit requirements.

Pretreatment systems are required by the LACSD to reduce pollutants to levels specified by local and federal limitations. The Sanitation Districts provides minimum requirements for pretreatment that consists of a three-compartment, gravity separation interceptor (clarifier) and sampling box, with a minimum detention time of 30 minutes, and a minimum capacity of 500 gallons. Additional required pretreatment facilities may include pH neutralization, clarification, flocculation, dewatering, or other more extensive facilities (LACSD, 2005b).

Standard Urban Stormwater Mitigation Plan – Los Angeles County Department of Public Works. On December 13, 2001, LARWQCB adopted Order No. 01-182. This Order is the NPDES Permit (NPDES No. CAS004001) for municipal stormwater and urban runoff discharges within the County of Los Angeles.

As adopted in December 2001, the requirements of Order No. 01-182 cover 84 cities, including the City of Industry, and the unincorporated areas of Los Angeles County. Under this, a Stormwater Quality Management Program (SQMP) has been implemented that addresses a number of different programs to reduce pollutants in stormwater and urban runoff. One of the programs implemented under the SQMP is the Development Planning Program. The Development and Planning Program requires that certain new development or redevelopment projects comply with the Standard Urban Stormwater Mitigation Plan (SUSMP), which outlines the necessary BMPs that should be incorporated into design plans.

The WCEP falls into the category of "redevelopment" under the SUSMP, and is thus required to follow the guidelines outlined in the Plan. It is at the discretion of the Los Angeles County DPW if a SUSMP is required. Additionally, a Water Quality Agreement, required by the Los Angeles County Flood Control District for commercial connections to the flood control system, is issued by the Los Angeles County DPW.

County of Los Angeles, County Code. Title 12 (Environmental Protection) of the Los Angeles County Code regulates the discharge of water to the storm system. Title 12 aims to protect the beneficial uses, marine habitats, and ecosystems of receiving waters that are carried by stormwater and non-stormwater discharges. This applies to all stormwater and/or runoff to the storm drain system and/or receiving waters within any unincorporated area covered by a NPDES municipal stormwater permit.

Section 12.80.460 of the County code lists prohibited discharges from industrial or commercial activities, unless the discharger complies with an NPDES permit.

Rowland Water District. For reclaimed water service, the WCEP will be required to submit an application of service (Service Agreement) to the Rowland Water District. The Service Agreement will stipulate the conditions of use of the reclaimed water such as price, operation criteria, and water quality parameters.

California Energy Commission Policy. The CEC adopted a policy in the 2003 Integrated Energy Policy Report that promotes the use of reclaimed water in order to minimize the consumptive use of fresh water for power plant cooling. That policy also encourages the use of a zero liquid discharge (ZLD) system to reduce water use. Since the WCEP is already using reclaimed water, no savings of fresh water would result with the implementation of a ZLD system. In addition to use of reclaimed water, the WCEP is using a high number (6) of cycles of concentration, which will also minimize its total use of reclaimed water. Use of a ZLD system would result in a small reduction in reclaimed water use, but at prohibitively high monetary cost. This cost is neither warranted nor required by the CEC policy.

8.15.6 Permits Required, Permit Schedule, Agency Contacts.

A summary of required permits and agency contacts is provided in Table 8.15-6.

TABLE 8.15-6
Water Quality Permits Required for WCEP

Permit	Schedule	Agency
Industrial Wastewater Discharge Permit	Minimum of 90 days prior to the commencement of the discharge	Los Angeles County Sanitation District PO Box 4998 Whittier, CA 90607-4998 Contact: James F. Stahl, Chief Engineer and General Manager (562) 699-7411
Water Quality Agreement/SUSMP	This occurs during the submittal phase for the design plans to the county for agency review.	Los Angeles County Department of Public Works 900 S. Fremont Avenue Alhambra, CA 91803 (626) 458-3517
Use of the National Pollution Discharge Elimination System General Permit for Construction	Submit Notice of Intent to use the permit at least 30 days in advance of construction, prepare SWPPP for local review	Los Angeles Regional Water Quality Control Board 320 West 4th Street. Los Angeles, CA 90013-2343 Contact: Xavier Swamikannu (213) 620-2094
User Agreement for Recycled Water		City of Industry 15651 East Stafford St. City of Industry, CA 91744 Contact: John Ballas, City Engineer
Water Quality Agreement		City of Industry 15651 East Stafford St. City of Industry, CA 91744 Contact: John Ballas, City Engineer

8.15.7 References Cited

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Visual Resources

Visual Resources

Development Plans

DR90. *Please prepare and submit a set of development plans for our review that contain all of the components relative to Site Plans and Elevation Plans, as required by the City's Development Guidelines and Development Plan Application (paragraphs A and C) process.*

Response: The Development Plan Application will be included in a future submittal.

Landscape and Irrigation Plan

DR91. *Please provide a landscape and irrigation plan that contains all the components required by the City.*

Response: The landscape and irrigation plan will be included in a future submittal.